THE ARTEFACT COLLECTION FROM WHITIPIRORUA (T12/16), COROMANDEL PENINSULA

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Abstract. The early or 'Archaic' beach midden at Whitipirorua, or Onemana, has produced a large and varied collection of artefacts now housed in the Auckland Museum.

The artefacts are typical of those found in similar sites along the eastern coast of the Coromandel Peninsula. Decorative pendants, fishing gear, adzes and a wide range of manufacturing tools such as drillpoints, sandstone files, hoanga, hammerstones and flake tools are described.

The stone artefacts show a heavy reliance on locally obtained resources and a predominance of Tahanga basalt for adze making.

Radiocarbon dates from recent excavations on the site indicate the artefacts predate the 15th century.

In the Auckland Museum there is a large collection of artefactual material, and archaeological samples, from the early Maori site of Whitipirorua, situated on the beach dune at Onemana on the Coromandel Peninsula (Fig. 1). The site is also known as T12/16 (N49/16) in the N.Z. Archaeological Association's site file system.

The majority of the artefacts were collected by R.G.W. (Bob) Jolly, assisted by other persons including Eleanor Crosby, Jim Donald, Beryl Jolly, Kim Jolly, Don Melrose, Pat Murdock, Tony Parsons, Hugh Simpson and David Trower. Although Jolly's attention was first drawn to the site in 1956, the bulk of the artefacts and samples were recovered between 1962 and 1973 when more than 44 separate visits were made to the site. In more recent years surface finds by John Coster, Sheridan Easdale, Louise Furey, Chris Jacomb, Gabrielle Johnston, Garry Law, Phil Moore, Annetta Sutton and Michael Taylor have added to the site's extensive assemblage. In addition, a few artefacts were recovered in small scale excavations carried out by the author in 1986 and 1988. Some of these artefacts are also described.

Jolly's activities on the site were a combination of excavation and surface collection. Artefacts and samples recovered were bagged according to date, and in some cases by square and layer. The most consistently provided information was the date of collection and the collectors' names. The material excavated had been sieved in most cases and sorted into identifiable artefacts, bone, various types of stone material, shell (if retained), pumice and other miscellaneous material such as charcoal and wood.

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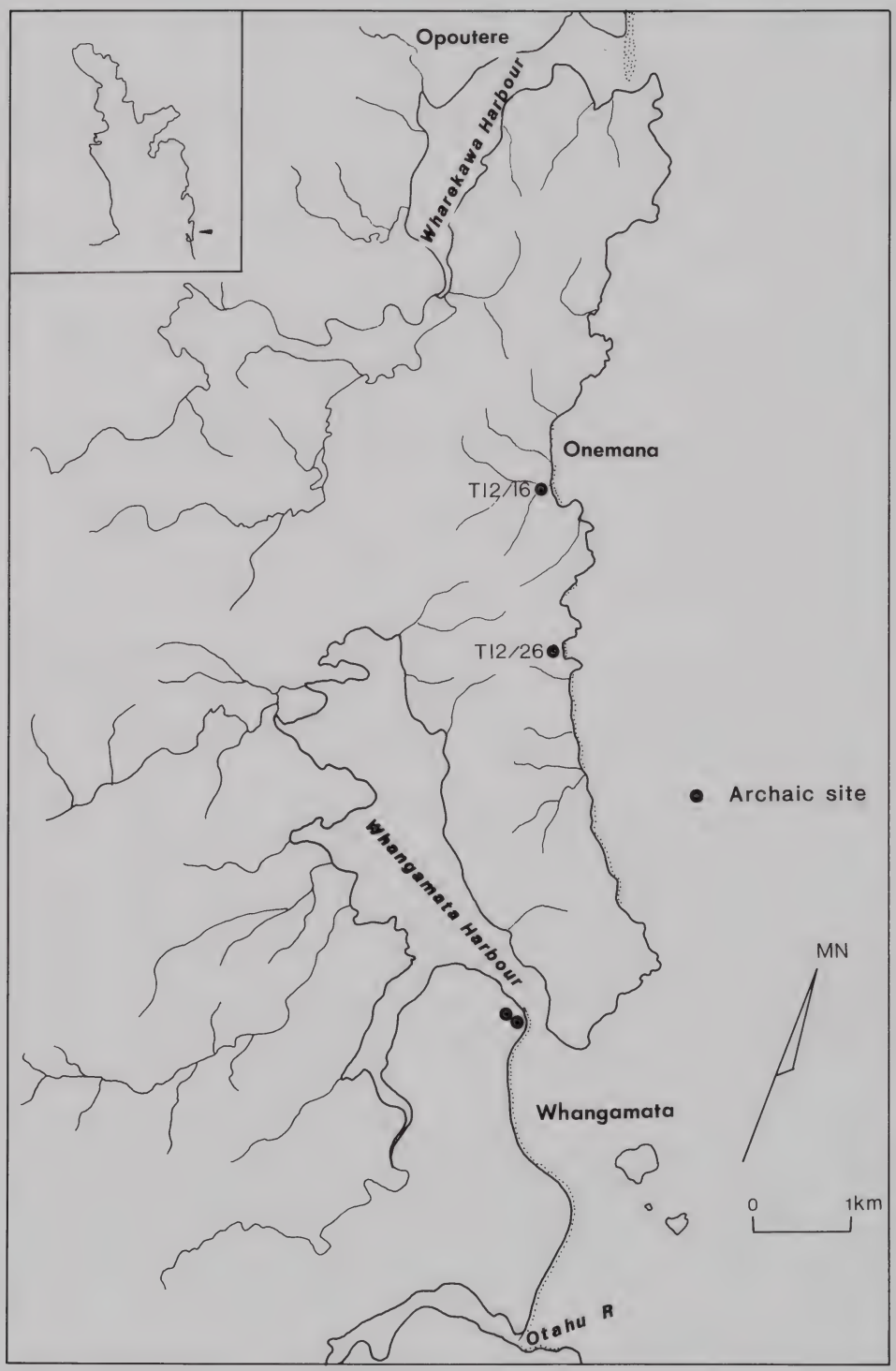


Fig. 1. Locality map.

Jolly's excavations over several years concentrated on two areas called the 'Main Hook Floor' or 'Site 1', and 'Mollie's Site' also known as 'Site 2', approximately 7 metres to the north near the stream (Fig. 2). Jolly (1978a:130) identified these areas as having a concentration of fishhook manufacturing material, estimating they were 12 x 12 m and 7 x 6 m respectively in size. Other locality descriptions are 'Minefy's', 'Eggshell Excavation', 'Upper Hook Site' and 'Top Site'. A number of individual squares were excavated intermittently over a considerable time period within each of these areas. In addition, artefacts were surface collected over the entire site as erosion exposed cultural material.

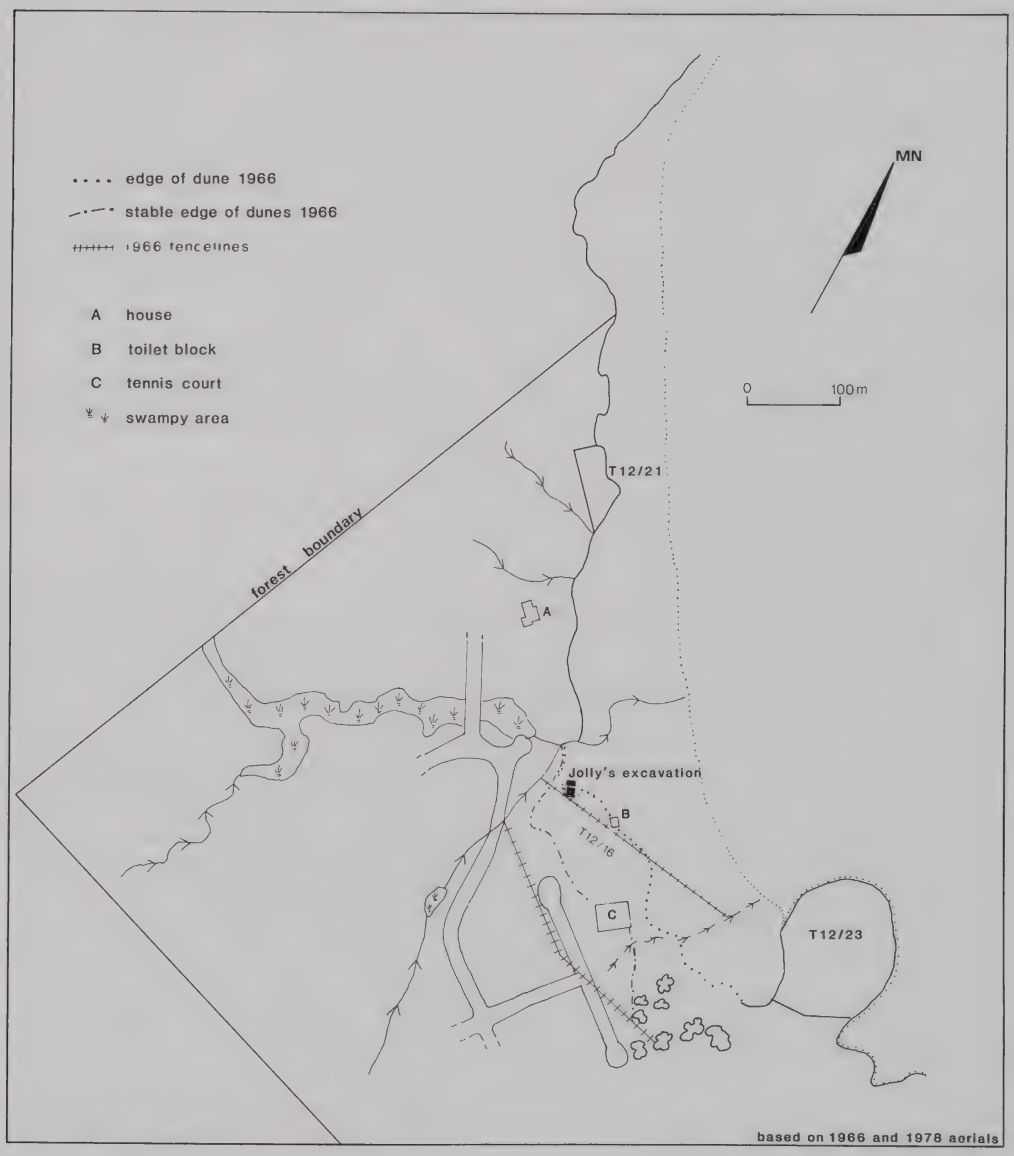


Fig. 2. Whitipirorua site, Onemana, showing location of Jolly's excavations.

Records and stratigraphic details relating to the sub-surface work carried out by Jolly are scarce. A brief article was published (Jolly 1978a) and general notes and a sketch of the site are in the files of the Museum's archaeology department. A map showing exposed concentrations of surface material was made by Mollie Nicholls (now Hougaard) in 1964 and published in the same article. Further information was obtained from the captions on the sample bags and artefacts. These were occasionally accompanied by a sketch map.

From the available information it can be reconstructed that there were two main cultural layers — an upper shell midden and a lower layer of mussel shells, separated by sterile sand. Jolly (1978a:130) described the stratigraphy as follows: "the main cultural layer is beneath sand with ordinary shell midden above. In some places the layer is about 30 cm thick, in others about 1 m. Mussels must have been easily obtained by the first comers as many shells rest close to the natural sand." Several sketch diagrams accompanying samples indicate a black sandy layer above the mussel shell layer in 'Mollie's Site', and many of the artefacts were recovered from the interface of the black layer and the sterile sand above (M. Hougaard, pers. comm.).

In 1974, during construction of the residential subdivision of Onemana, sand quarrying and general recontouring of the dune area destroyed the northern part of the site including the area investigated by Jolly.

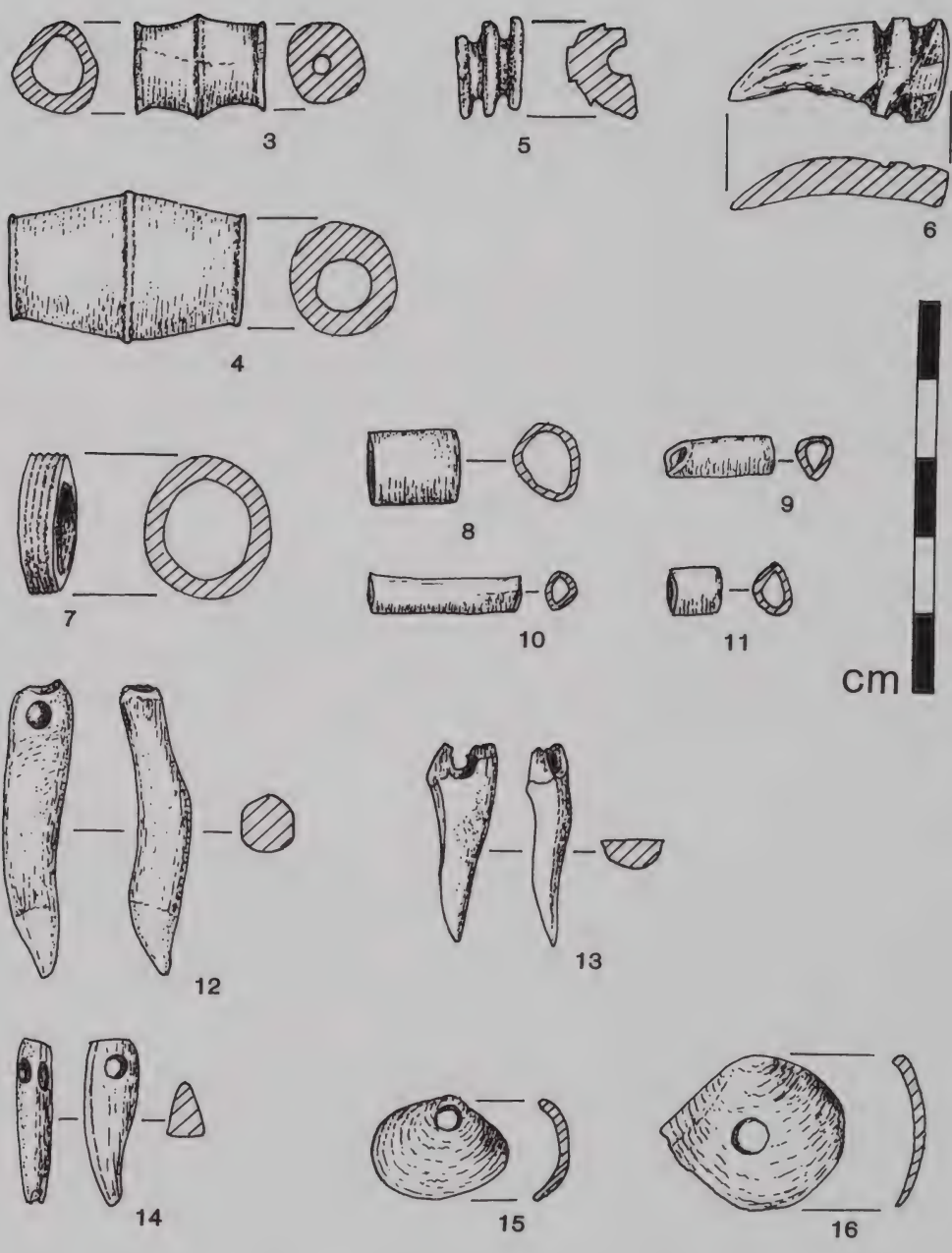
Because of the lack of consistent and reliable layer information, the collection has been described collectively as an Archaic assemblage without reference to area location or possible relationships within or between layers.

Catalogue numbers

Artefacts and samples have catalogue numbers prefixed with either an AR or AU. This refers to the repository when the items were first accessioned. AR is the prefix denoting the archaeology collection in the Auckland Museum. AU indicates the Anthropology Department of Auckland University where some of the collection was initially placed prior to an archaeology department being set up at the Museum. All material with an AU number is now permanently located in the Auckland Museum. There are also several items with no alphabetic notation which are part of the general ethnology collection in the Auckland Museum. A few items, which were still in the possession of the late Mr Jolly when this paper was being researched, are identified jointly by the catalogue number relating to the Jolly collection and the more recently acquired Auckland Museum AR number.

ORNAMENTS

A variety of ornaments in bone, ivory and shell have been recovered from the site (Figs. 3-16). Similar pieces have been recovered from other early sites. Several of the pendant styles have their origin in East Polynesian material culture (Davidson 1984:77-81).



Figs. 3-16. Ornaments, Whitipirorua site. 3-5. Reel necklace units. 3. AR5472. 4. AR4408. 5. AR4683. Reel preform. 6. AU1525/1. Dentalium shell unit. 7. AR310. 8-11. Bird bone tubes. 8. AR4633. 9. AU1522/2. 10. AR5470. 11. AU1522/3. 12-14. Pendant units. 12. AR176. 13. AU1593/2. 14. AR2238. Perforated shells. 15. AR6338. 16. AR4631.

Reels

Three reel necklace units, of varying sizes, are in the collection. AR5472 (Fig. 3) appears to have been manufactured from a section of bird limb bone and is a good example of a reel with three transverse ridges. A larger reel, AR4408 (Fig. 4) is very similar and made of ivory. The central longitudinal hole has been drilled from both ends. AR4683 (Fig. 5) is a different type of reel with the three transverse ridges in sharper relief than in the other two examples. The reel is broken longitudinally.

An artefact in the process of manufacture, AU1525/1 (Fig. 6) was possibly intended to be a reel similar in shape and size to that shown in Fig. 5. The eye tooth of a sea mammal has two grooves at the root end. The tooth enamel has been partially ground off and the surface faceted at the upper end. The tooth has longitudinally split in half. In the case of small reels it is likely the reels were manufactured on a longer segment of raw material and the surplus sawn off later. A similar technique is described in Duff (1977:93).

Bone tubes

Eleven cut bone tubes, varying in length from 6.6 to 18.5 mm, indicate another common ornament type of the early period. A selection of sizes are shown in Figs. 8-11. All have parallel transverse end cuts with the exception of AU1522/2 (Fig. 9) which has an angled cut at one end. One very small cut tube has an outer diameter of 2.9 mm and is of a similar size to the *Dentalium nanum* tube segments.

Dentalium rings

Eleven rings cut from fossil *Dentalium* shell are listed in the catalogues. Only eight were located. Narrow transverse grooves, varying between two and four in number, have been scored around the circumference of each ring. The natural longitudinal ridging pattern on the shell appears as shallow notching on the surface of the rings, adding to the decorative effect. In the case of AU1101 four rings are of decreasing size, suggesting they were cut from one *Dentalium* tube.

AR310 (Fig. 7) was excavated by Jolly from 'Mollie's Site' while the remaining rings (AU1101) were found together on the surface at the southern end of the site in the vicinity of a burial. However it is not known if there was a direct association.

Dentalium nanum was also found in the site although not in large quantities.

Leach (1977:476) tentatively identified the fossil shell as *Dentalium solidum*, found in fossiliferous Miocene mudstones. Although these mudstones occur in a number of places throughout New Zealand, the quality of the *Dentalium* shells, and suitability for use in artefacts, varies considerably.

Dentalium nanum has been reported from a number of Coromandel sites, but the larger *Dentalium* shell is known only from Hot Water Beach where the shell had been worked to duplicate a bone reel with three transverse ridges (Leahy 1974:40,42).

Pendants

Two perforated teeth and a shaped bone artefact were probably intended to be worn individually as ear pendants, or collectively with a number of similar objects as necklaces.

The tooth of a sea mammal (AR176, Fig. 12) has a hole drilled through one side at the root end. The attachment cord presumably passed through the hole and out through the hollow tooth cavity.

A tooth from a mako shark (*Isurus oxyrinchus*) (AU1593/2, Fig. 13) had a hole drilled at the upper end although this is now broken.

A small shaped bone pendant, AR2238, has one side flattened and an outward curve at the lower end (Fig. 14). The perforation is bi-laterally drilled. This artefact is similar in shape to the imitation whale tooth pendant unit, a popular style in the early period which continued to be made through time in more generalised shapes (Furey 1986). This particular example, with a length of 23 mm, is considerably smaller than other similar units held in museum collections and illustrated in Duff (1977:112-119) and Davidson (1984:80).

Perforated shells

Four perforated marine bivalve shells from two species may have been necklace or ear pendants. AR6338 (Fig. 15) comprises two shells of a *Tawera* sp. Although of the same size, they appear to be from different shellfish. Both AR4631 (Fig. 16) and AR547 are of a *Myadora* sp. These are however of different sizes.

Similarly drilled shells have been found in other Coromandel Archaic sites, and a necklace of drilled *Myadora* shells was recovered from Wairau Bar.

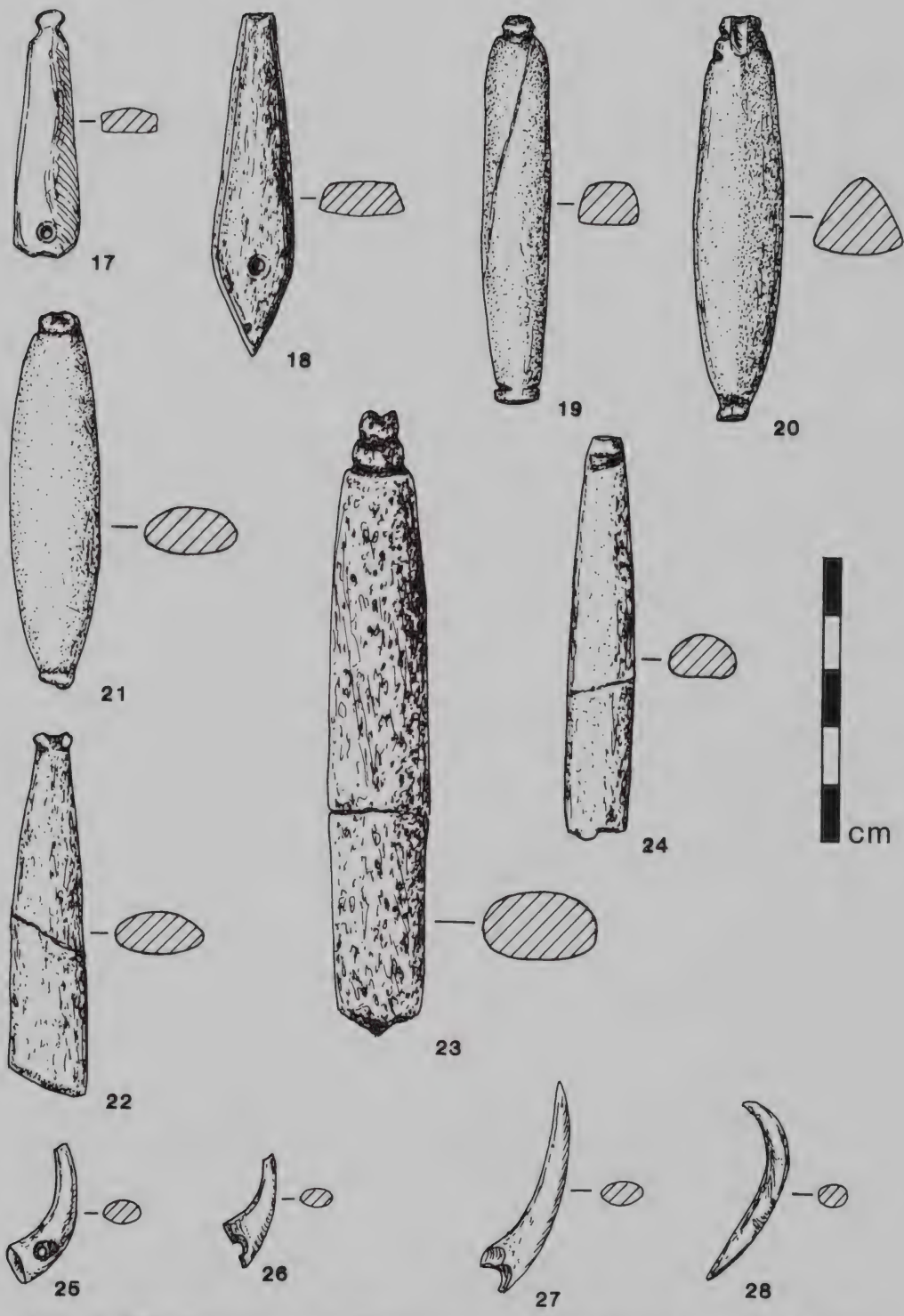
FISHING GEAR

A full range of fishing gear from trolling hooks and lures to one- and two-piece hooks in bone and shell are represented.

Trolling lure shanks

Eight complete or near complete lure shanks have been made from either stone, bone or shell (Figs. 17-24). Several different forms of line and point lashing are apparent. All can be assigned to the early grooved shank series defined by Crosby (1966).

AR5469 (Fig. 17), fashioned from the shell of a marine bivalve, has a dorso-ventral hole for line lashing and reduces in width towards the point attachment end. A notch on either side facilitates lashing of the point as does a notch on the end. Davidson (1979:195) likens the shield shape of this lure to examples from Murihiku. Shell lures are relatively uncommon on the Coromandel Peninsula and this is a particularly well preserved item.



Figs. 17-28. Trolling fishing gear, Whitipirorua site. 17-24. Trolling lures. 17. AR5469. 18. AU1593/1. 19. 46450. 20. AR46451. 21. AR46452. 22. AR46454. 23. AR46453. 24. AR46455. 25-27. Trolling hook points. 25. AR5461. 26. AR4444. 27. AR7493. Barracouta hook point. 28. AR5462.

Another lure shank, AU1593/1 (Fig. 18), also with a dorso-ventral hole, has a pointed head with a circular groove on the nose. The end is squared. The stone material is schist, the source of which would have been in the South Island (K. Prickett, pers. comm.). Both AU1593/1 and AR5469 have a flattish cross-section and are similar to the Tairua pearl-shell lure interpreted as an early lure shank form (Green 1967:84) with parallels in East Polynesia.

The remaining lures have grooves or notches for line attachment. 46450 (Fig. 19), made from mudstone, has a circular groove for line lashing and side notching for point attachment. The lure is rounded rectangular in cross-section with a flattened back.

The remaining lures all have a levelled platform for hook seating although the lashing form varies. Side notching occurs on 46451-4 (Figs. 20-23), while 46455 (Fig. 24) has a ventral slot. On 46452 notches on the ventral side form a V. Cross-sections represented are oval, rounded triangular and rounded with a flattened dorsal surface. 46451 and 46452 are made from limestone, while the remainder are of bone. 46453 is whale bone and is the largest lure with an incomplete length of 110.2 mm (the head is missing).

Stone lure shanks are rare in Coromandel Archaic sites as are shanks of triangular cross-section (Davidson 1979:195). The lure made from schist is particularly important as the stone shanks present in Coromandel sites tend to be made of locally available materials.

Lure hook points

Two of the three lure hook points, all made of bone, are similar. Both are uni-perforate points with no projections. This is the most common type of lure point to be found on the Coromandel Peninsula and is the only type represented in excavated site assemblages. However a bi-perforate example is known to have been surface collected at Port Jackson (Foster 1983:58,62-63).

AR5461 (Fig. 25) and AR4444 (Fig. 26) are examples of the uni-perforate lure hook point. AR5461 has a slightly concave base and an intact lashing perforation. AR4444 is similar but is a smaller hook.

AR7493 (Fig. 27) cannot definitely be categorised as a lure hook point but the lashing perforation and angle of the hook does suggest that was its use.

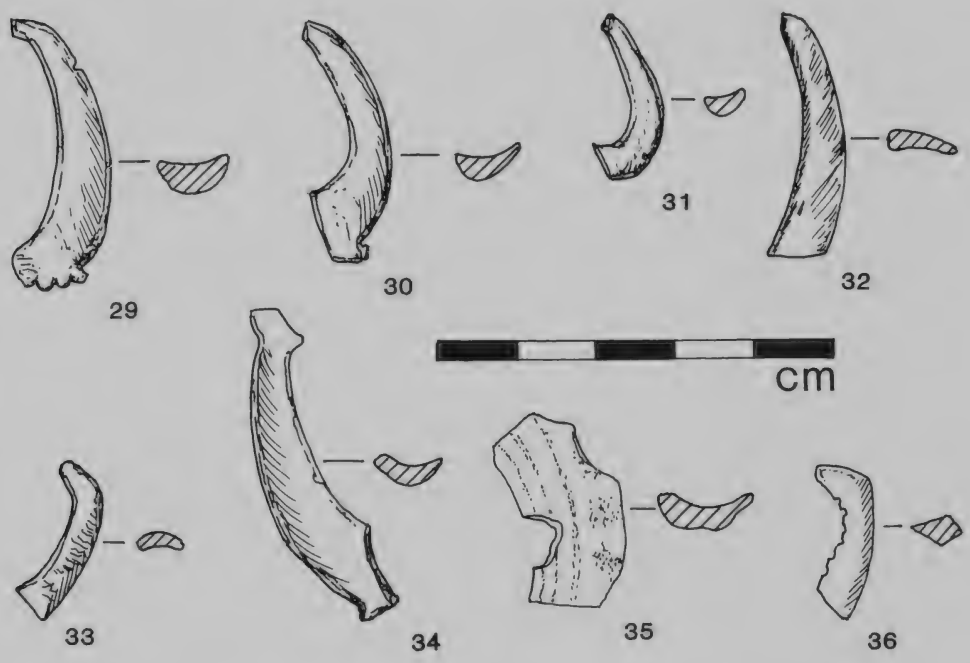
Barracouta hook point

A bone point (AR5462, Fig. 28), reminiscent of a barracouta hook point, is round in cross-section and has an indentation at the mid-point on the outer curve. The point does however have a greater curve than is apparent in many other barracouta hooks. Crosby (1966:150) suggested that the curved points associated with barracouta trolling gear were a late introduction from the South Island, but this is in no way substantiated, and the presence of this artefact in the collection does tend to negate the argument.

Shell fishhooks

Shell fishhooks are not common on early Coromandel sites, previously being known only from Cross Creek (Sewell 1988), Wheritoa (Crosby 1977:27,28), Hot Water Beach (Leahy 1974:37) and the Opito sites of N40/16 (Law 1984) and N40/2 (Murdock & Jolly 1967, Jolly & Murdock 1973).

Complete one-piece shell hooks are absent from this collection but several examples of two-piece hook points and one shank, all made from *Cookia sulcata*, are present (Figs. 29-34).



Figs. 29-36. Shell two-piece fishhooks, Whitipirorua site. 29-33. Shell points. 29. AR5474. 30. AR5478. 31. AR5478. 32. AR4407. 33. AR5463. Shell shank. 34. AR5478. Shell hook blanks. 35. AR7720/1. 36. AR5463.

The points are most easily described according to the form of the attachment base where point and shank were joined together with cord. Four lapped bases, with the number of notches ranging from three to five, are present although only two of these are complete with the point tip attached. AR5474 (Fig. 29) is the largest example. Three points with a base for butting against the shank are also present. Again AR5478 (Fig. 30) is the largest.

AR5478 (Fig. 31) is unusual in that it does not have a notch or projection on the outside of the curve but is in all other respects similar to the points with a lapped attachment. The curve is flattened at the place where the notch would have been but there is no clear evidence it has been broken off, nor that it has been repaired.

In addition three straight points, for example AR4407 (Fig. 32), have no means of attachment and may have fitted into a slotted shank as discussed by Law (1984:8).

AR5463 (Fig. 33) is an anomaly in that it has an incurved point with no reduction in width at the point end, and also no evidence of attachment. It is possible that this is part of a one-piece hook.

One complete shank (AR5478, Fig. 34), also with a butted base, indicates that in this site shell shanks were utilised but the general absence of shell shanks from sites containing shell points led Law (1984:5) to suggest wood may have been a more commonly used material.

Manufacture of shell fishhooks is indicated by three tabs of *Cookia sulcata* of which AR7720/1 (Fig. 35) is an example. It is suggested from the shape of the tabs that two-piece hooks are being made. In addition a hook fragment, AR5463, in the next stage of manufacture with drilling scars on the inner curve is illustrated in Fig. 36.

One-piece fishhooks

The Coromandel Archaic sites have produced large numbers of one-piece fishhooks, and Whitipirorua is no exception. Although nearly all the hooks are broken, parts of at least 51 individual hooks are present when point limbs and shank limbs are totalled. Broken fragments of bend also occur. In addition, over 220 tabs have been recovered. The hooks are made from a variety of materials. Bone hooks are the most common with moa, whale and sea mammal represented. Ivory and shell were also used.

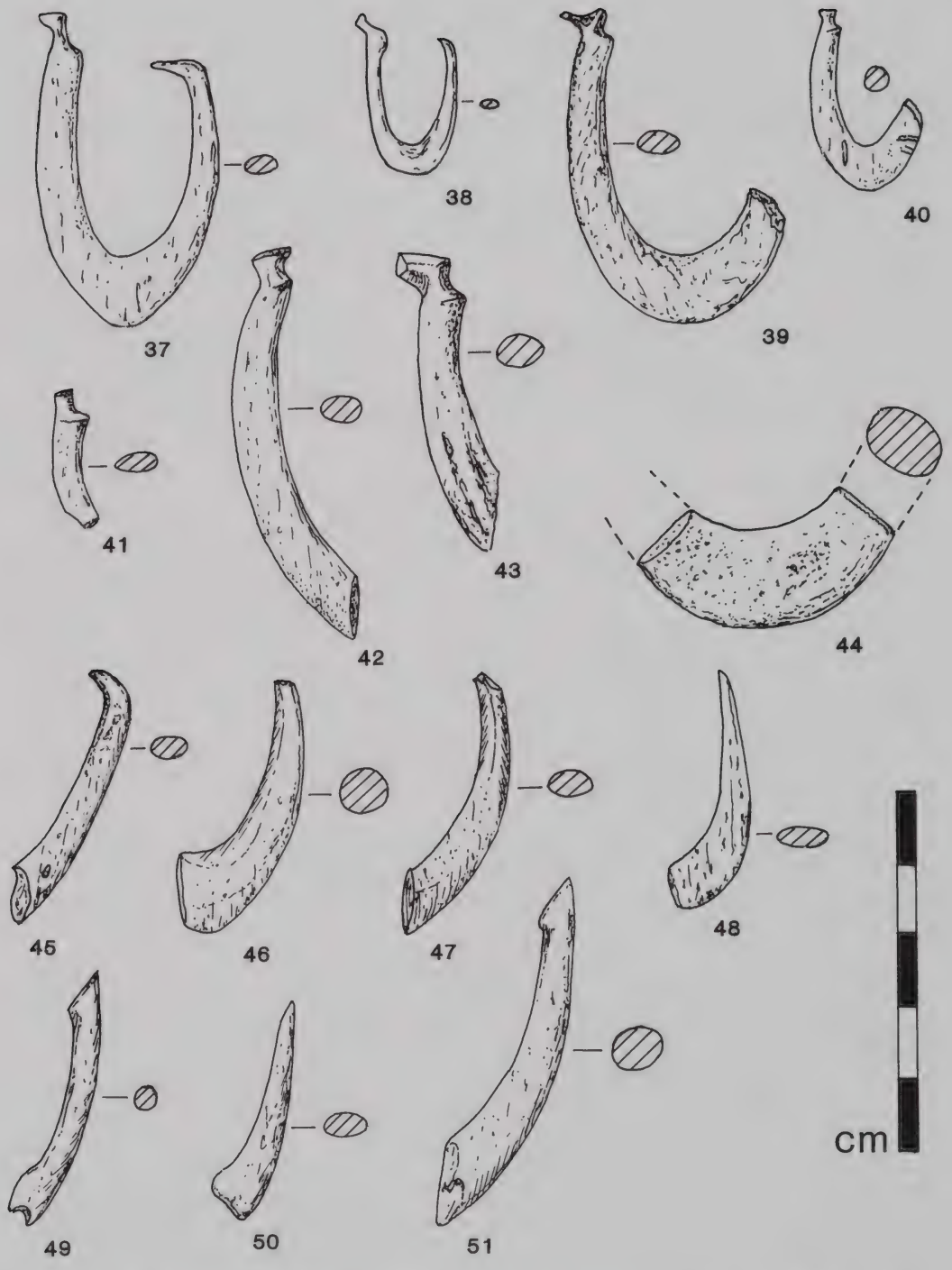
The hooks most commonly fit into the type called Opito I, defined as an oval one-piece hook with an incurved point (Crosby 1966:187-188).

Two complete hooks (Figs. 37,38) illustrate the basic Opito Type I, and the size range available. Jolly Coll. 83 (AR7947, Fig. 37), fashioned from moa bone was found in the lowest level of the Upper Hook Site associated with a layer of mussel shells. Jolly Coll. 84 (AR7948, Fig. 38) is an ivory hook.

The hooks from the site are generally in the small to medium size range and this is reinforced by measurements of discarded tabs (Fig. 74). One exception is the bend of a whalebone hook (AR5466, Fig. 44) which must have been of a large size.

The remaining hooks have generally been broken across the grain at the base or lower part of either the point or shank limb near the bend.

Several forms of head occur. The most common is illustrated by AR4612 (Fig. 42), where scarfs have been cut to facilitate lashing. A variant of this is shown in AR7477/1 (Fig. 39) where an additional scarf creates a notch in the top of the head. Another type, with an extended head (AR227), is shown in Fig. 43. This form is uncommon on Coromandel sites and is represented in the collection by a single specimen. AR4839 and AR4634 (Figs. 40,41) illustrate another head form which has no knob. This type does occur in other sites in conjunction with the more common knobbed variety.



Figs. 37-51. Fishing gear, Whitipirorua site. 37-48. One-piece fishhooks. 37. AR7947. 38. AR7948. 39. AR7477/1. 40. AR4839. 41. AR4634. 42. AR4612. 43. AR227. 44. AR5466. 45. AU1296. 46. AR342. 47. AR173. 48. AR7736. 49-51. Two-piece hook points. 49. AR4815. 50. AR4970. 51. AR4815.

While the majority of fishhooks, for example AU1296 (Fig. 45), have an incurved point typical of the Opito Type I hook, straight points which Crosby (1966:201) called Opito Type II, and interpreted as a reworked Opito I, are also present (AR342, AR173, AR7736, Figs 46-48). It is by no means certain that the differences are so easily explained as the function of the hook is changed from a rotating to a jabbing hook.

Bait notches are not common but do occur. AR4839 (Fig. 40) has a shallow groove on the point limb.

Two-piece bone hooks

The identification of some two-piece hook points is problematical in that lashing or drill holes at the base may be equally due to repairs carried out on broken one-piece hooks or to deliberate two-piece manufacture.

Two, both AR4815 (Figs. 49,51), with a straight jag tip differ from any of the one-piece hooks and are therefore more likely to be two-piece hook points. Both have evidence of broken out drill holes at the base of the shank to indicate where the point was lashed to the other part of the hook. This is an unusual lashing form, the more common type being outer notches. An alternative, and equally likely, interpretation of these points is that they are trolling lure hooks. Leach (1979:101) observed that "certain identification of lure points is difficult since they are basically the same shape as those for two-piece hooks", while Crosby (1966:148-149) associates the jag tip form of drilled lashing point with the early grooved shank series of kahawai lure, several of which were found in the Whitipirorua site.

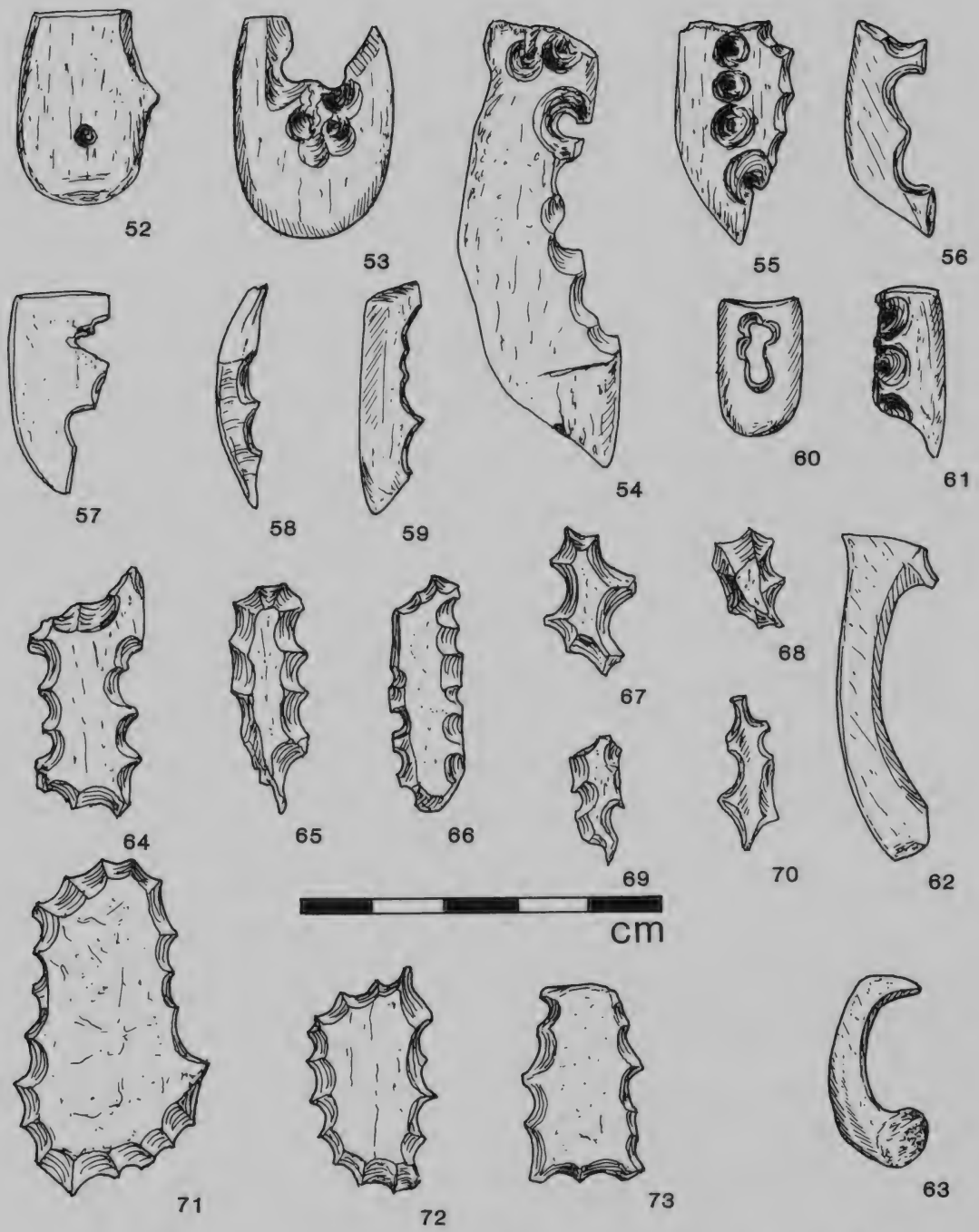
AR4970 (Fig. 50) has a straight point similar to the Opito II variety of one-piece hook but has evidence of a drill hole at the base. This particular point may be either a two-piece or part of a repaired one-piece hook.

Manufacture of hooks

There is a considerable amount of evidence for one-piece fishhook manufacture on-site. The various stages of manufacture, from prepared pieces of bone through to shaped but not completed fishhook pieces, are shown in Figs. 52-63, along with a selection of tabs (Figs. 64-73) drilled from the centres of the hooks.

The manufacturing debris shows a greater range of raw material than is evident in the finished hooks. Bone, ivory (Figs. 57,60,61), and shell (Fig. 59) were used. AR4611 (Fig. 54) is a fragment of mammal jaw. AR4882 (Fig. 58), a tooth, is most likely intended as part of a composite hook. The smallest hooks appear to have been made from ivory. This is apparent from the finished hooks and the tabs. Shell and ivory tabs also tended to be thinner than their bone counterparts, perhaps reflecting greater strength in the material being used.

A plot (Fig. 74) of the size of tabs reinforces the evidence from the finished artefacts that the hooks fall into the small to medium size range, with only a few being very large.



Figs. 52-73. Fishhook manufacturing debris, Whitipirorua site. 52. AR314. 53. AR172. 54. AR4611. 55. AR4635. 56. AR4744. 57. AU1525/4. 58. AR4882. 59. AR4611. 60. AU1721. 61. AR5476. 62. AR4709. 63. AU1525/3. 64. AR313. 65. AR2238. 66. AR260. 67. AR4744. 68. AR4744. 69. AR4722. 70. AR4456. 71. AR4444. 72. AR4744. 73. AR4635.

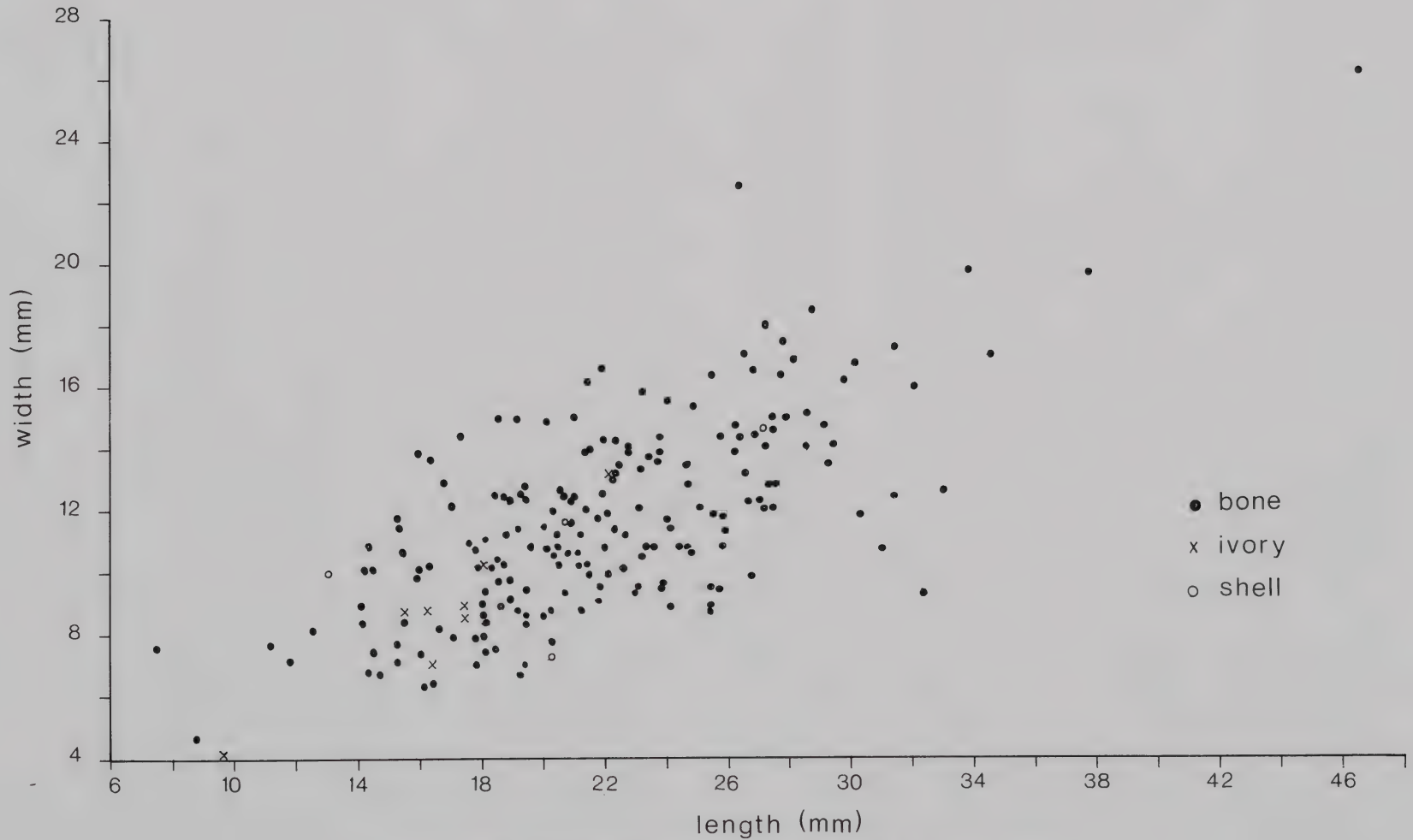


Fig. 74. Size distribution of one-piece fishhook cores, Whitipirorua site.

The size distribution of cores is similar to the situation at Hot Water Beach where it was found cores exceeding 30 mm in length could be considered large for the site, and cores under 15 mm were small (Leahy 1974:36). The median length of the tabs is also similiar at both sites, with 21.4 mm at Whitipirorua and 22 mm at Hot Water Beach. At the Opito Beach Midden, N40/3, Boileau (1980:70) concluded from the size of the cores that larger hooks were being used.

MISCELLANEOUS ARTEFACTS

A selection of other bone and shell artefacts are shown in Figs. 75-83.

Tattooing chisel

AR5475, a tattooing chisel (Fig. 75) has not been firmly provenanced to Whitipirorua but it is most likely to have come from this site. The chisel, along with other material was presented to the Museum by Mr Jolly with an accompanying note stating "salvaged from assemblage of unknown provenance almost certainly Whitipirorua on account of presence of many wonder stone [chert] chips and local obsidian".

The chisel is reduced at the upper end and the centrally drilled hole has broken out. At the lower end one side is incomplete but eight teeth or remnants of teeth remain. A further three teeth may have been present in the broken area. The cross-section is crescent shaped.

Two pieces of worked bone, fashioned from lengths of bird limb, may have been tattooing chisel blanks. AR7731/2 (Fig. 79) has parallel sides while AR7731/1 (Fig. 80) has tapering sides. In each case, the bone has been sawn at one end and then snapped, the other end snapped off without preparation, resulting in a rough break. The sides have been ground. The pieces bear a strong resemblance in width and cross-section to the tattooing chisel from the site. Other suggested uses include blanks for fishing lure shanks but the bone is likely to be too thin for this, or alternatively bird spear blanks although the length would possibly be inadequate for this purpose.

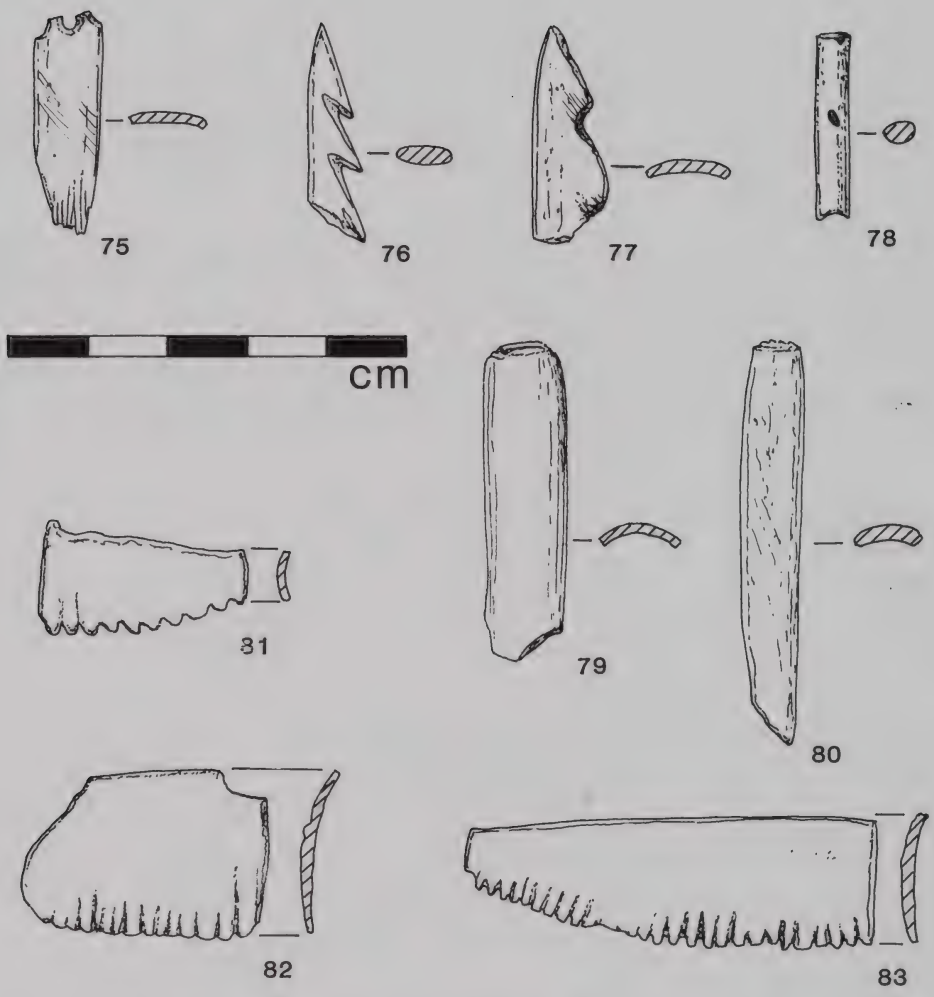
Bird spears

Two bird spears are present in this collection.

AR7730 (Fig.76) is incomplete. Probably made from mammal bone, the spear is solid oval in cross-section. The barbs, on one side only, are worked from front and back.

AR4443 (Fig. 77), also incomplete, is made on a bird limb bone and has a crescentic cross-section. The tip end with two shallow barbs is worked on the front side only and is broken below the second barb.

Bird spears are a rare find from an early site. The only other Coromandel sites to have bird spears are Harataonga (Law 1972:88) and Wheritoa (Crosby 1977:29-30).



Figs. 75-83. Miscellaneous bone and shell artefacts, Whitipirorua site. Tattooing chisel. 75. AR5475. Bird spears. 76. AR7730. 77. AR4443. Bone toggle. 78. AU1598. Bone preforms. 79. AR7731/2. 80. AR7731/1. 81-83. Worked shell. 81. AR7726/3. 82. AR7726/2. 83. AR7726/1.

Bone toggle

An unusual piece of bird limb bone (AU1598,Fig. 78) attracted attention. The ends of the bone, although now ragged, have the remnants of cut surfaces. More importantly, a small hole 1 mm in diameter is centrally situated through one wall of the shaft. The hole is slightly irregular in shape indicating it was punched rather than drilled. Although only 23.5 mm long and with a diameter of 3.6 mm, this object may have been a toggle. While toggles are more commonly larger in size, single strand necklaces or wristlets of, for example, *Dentalium nanum*, may have been secured by just such a small fastener.

Worked shell

Four similar pieces of shaped paua shell (*Haliotis* sp.) have been surface collected from the site in recent years. In addition, another piece was recovered during the 1986 excavation on the site (Furey, in prep.). All pieces were from the same area within the site.

Only one piece is intact (AR7726/1, Fig. 83). The three straight edges have been cut and ground smooth while the remaining edge has 27 notches along its length. AR7726/2 (Fig. 82), is broken but is wider than the previous example. The notches (or teeth) are not as pronounced or as well defined on this piece. Some grinding down of high points of the outer layers of the shell cortex has occurred suggesting it was to fit into, or butt against, another object. AR7726/4 is of similar width to AR7726/2, while AR7726/3 (Fig. 81)), although incomplete, is more like AR7726/1 in shape.

The fragment recovered by excavation, AR7737, was also in the surface sand but can be assigned to a cultural layer deposited in the 15th century (Furey, in prep.).

Worked shell pieces or discs, albeit with all sides notched, have been found in other sites (for example Rakautara Cave, Tumbledown Bay and Oruarangi) and interpreted as decorative insets for wood carvings (Davidson 1984:82).

The function of these particular pieces is not clear. If intended as insets on for example, kahawai fishing lures, it would be unnecessary to notch one side, and ethnographic examples held in the Auckland Museum do not have notching. It is also apparent the pieces were not intended to be pendants similar to the notched paua piece found at Sarah's Gully (Davidson 1986) as there is no form of attachment such as a suspension hole. The grinding of the cortex side on AR7726/2 and AR7737 suggests smoothing for attachment to another object, perhaps a wood carving, where the notched edge would form an important part of the decorative effect.

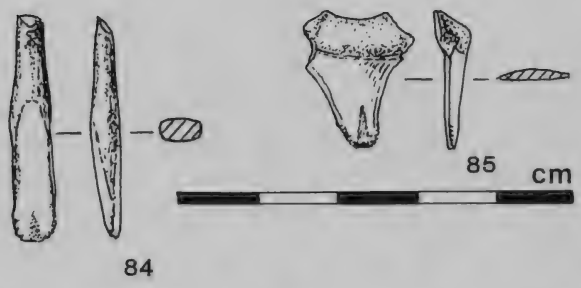
Bone needles

Six bone needles indicate fine sewing was being carried out. None of the needles have an intact eye. All are small in size with a diameter at the upper end ranging from less than 1 to 2 mm. The points on all the needles are very sharp.

Modified shark teeth

Two teeth from the white pointer shark (*Carcharodon carcharias*) have been modified and show evidence of use.

AR2238 (Fig. 84) has been considerably reduced in width and shape and the origin of the object can only be identified from the natural serrations present towards the lower end. The base of the tooth has been blunted and ground. Angled scratches on the enamel front and back above the tooth serrations can be attributed to the grinding or reduction of the sides. Here the enamel has been removed and the dentine exposed. The upper, or root, end of the tooth has also been altered and is a half-circle in cross-section.



Figs. 84,85. Modified shark teeth, Whitipirorua site. 84. AR2238. 85. AR2234.

AR2234 (Fig. 85) is more recognisable as a tooth but has also been modified. Again the end of the tooth is blunted with striations on the enamel and dentine, and like AR2238 the natural serrations towards the lower end have been retained and on both artefacts are intact, showing no signs of wear. There is evidence that the curve of the tooth above the serrations has been formed by reduction of the sides. The root end of this tooth has been modified by removal of the normally protruding sides.

Examination of unmodified white pointer shark teeth indicates that although the pointed lower end of the tooth can be broken off naturally, the vertical chipping, or flaking of the enamel, and the bluntness of the end encountered in both artefactual pieces is not a natural accompaniment.

Modified teeth from the white pointer shark have also been reported from Wairau Bar (Duff 1977:223-224) and Hahei (Harsant 1985:32-33). Duff interpreted the Wairau Bar item as an unperforated tattooing chisel intended for hafting. The Hahei example has a broken suspension hole which led Harsant to suggest use as a pendant. In shape it is very similar to AR2238 from this site, although the point is still intact.

It is unlikely the two teeth from this site were intended as pendants. Shark teeth were used ethnographically for a variety of uses including saws (Barrow 1962) and as drill bits (Best 1974:93). However, the nature of the damage to these pieces could not be attributed to use in either a saw or as a drill bit. The blunting on the end is more likely to have been caused by a chiselling or gouging action and this is reinforced by the evidence of the chipped enamel at the lower end. AR2238 with the upper end very reduced in size could have been hafted although there is no microscopic evidence for this. Certainly the rounded shape at this end is reminiscent of a hafting form.

Bone awls

Three bone awls have been identified. These have been made by grinding a piece of moa bone to a point at one end. Two (AU1522/28 and AR4707) are shown in Figs. 87,88. An awl-like piece of bone, AU1593/18 (Fig. 86), triangular in cross-section, is flaked on two edges at one end and has use polish on the reverse side. This artefact could possibly be interpreted as an awl blank undergoing preliminary reduction before grinding but this would not explain the use polish. A similar artefact, AR224, also has reduction flaking on the sides but does not have evidence of use polish.

Figs. 86-92. Bone awls and worked bone, Whitipirorua site. 86-88. Bone awls. 86. AU1593/18. 87. AR4707. 88. AU1522/28. 89-92. Worked bone. 89. AU1522/27. 90. AR233. 91. AR4583. 92. AR4707.

Worked bone

A number of pieces of worked bone were recovered. These were from sea mammal or moa and several are illustrated in Figs. 89-92. Various techniques of working the bone are indicated — principally cutting, sawing and snapping (Figs. 89,90,92) and grinding(Fig. 91). Saw marks are usually evident on both sides of the bone with the main cut on one side and a shallow groove on the other to enable controlled breakage.

ADZES

Complete adzes are poorly represented in the collection. There are a number of adze blanks and fragments of blanks. Few of the finished adzes have a high proportion of polish and appear to have been worked by flaking, with a small amount of hammerdressing present. Polish is generally confined to the bevel and blade area with some polish evident on the sides of several of the complete adzes. Reworking or reshaping is also apparent from some of the fragments. The more complete pieces are shown in Figs. 93-97.

Very few of the preforms have reached the stage of bevel formation and in some cases it is difficult to determine if a partial preform is intended to be a blade or butt end. From the number of fragments it is apparent that end shock during manufacture was common.

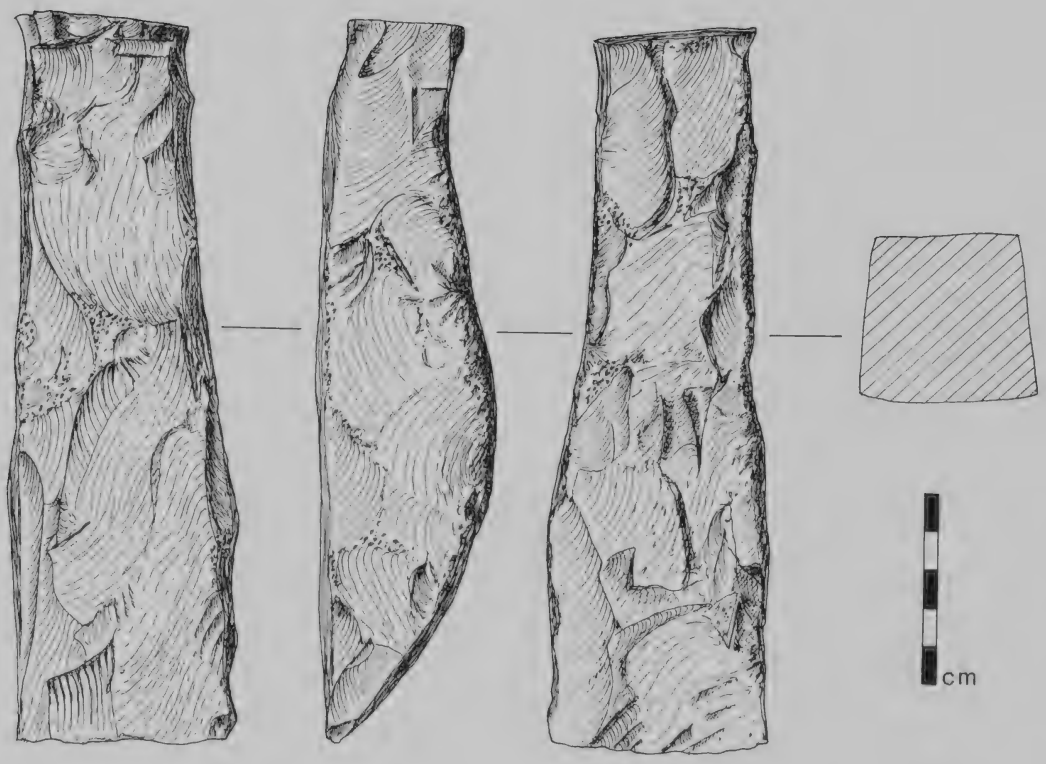


Fig.93. Adze, Whitipirorua site. AR7886.

The adze material, including both finished adzes and preforms, falls into two general cross-sectional shapes, quadrangular and rectangular, although triangular, square, lenticular, and irregularly shaped sections which do not readily fall into any established typology, also occur. However this is not unusual as a large number of adzes and blanks from Coromandel Archaic sites are irregularly shaped in cross-section (Boileau 1980:75; Davidson 1979:199).

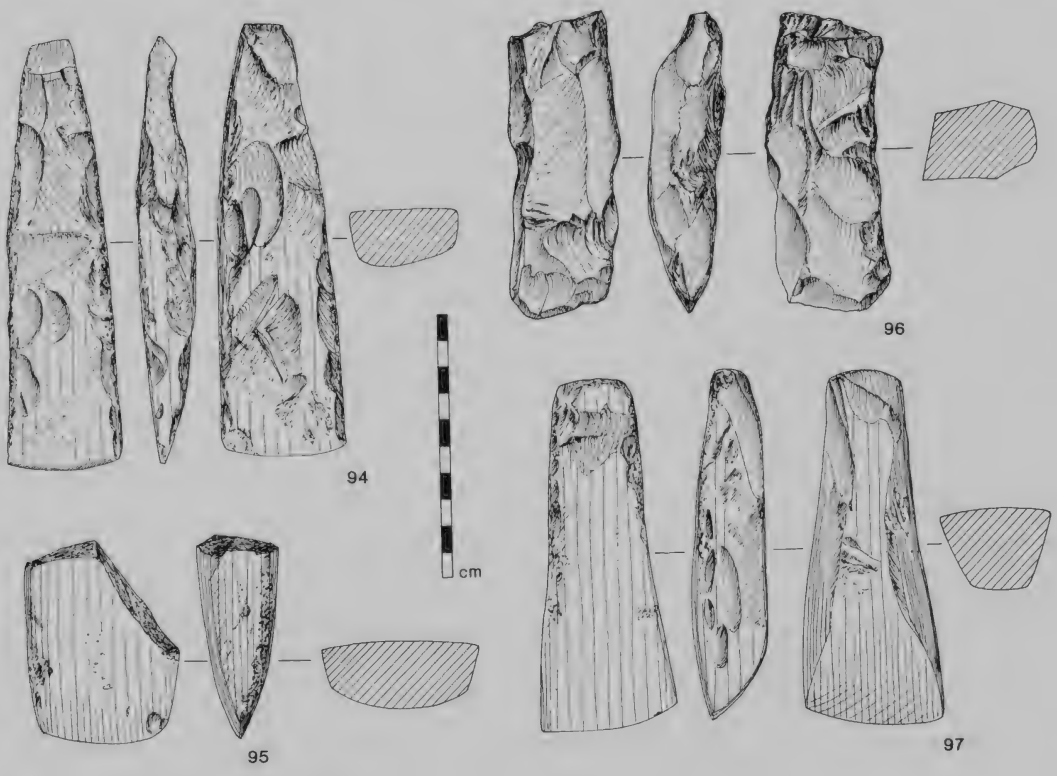
The majority of the adzes and preforms are made from Tahanga basalt. Other stone types, namely metasomatised argillite, non-metasomatised argillite, chert, and a fine grained black basalt also occur.

The complete adzes will be described below, together with a selection of preforms.

Quadrangular adzes

An adze held by Mr Jolly (Jolly Coll. No. 21, AR7886, Fig. 93) is made of Tahanga basalt and has a quadrangular cross-section with the back narrower than the front. The adze most closely approximates Duff's Type 1A. However, because the adze is thicker than is usual in a Type 1A, the cross-section is almost square. The adze is flaked all over with some hammerdressing in the vicinity of the haft area. Two lug-like protuberances occur at the poll end on the back, caused by the detachment of two deep flakes. A striking platform, which forms the poll, indicates the adze was made on a large flake. The adze is thick and heavy-looking for its overall length of 185 mm. The width at the blade is 57 mm.

A small flaked adze in the Jolly Collection (AR7968) is also quadrangular in cross-section with the back narrower than the front. Made from Tahanga basalt the adze is flaked, with some hammerdressing on the sides, and remnants of polish on high



Figs. 94-97. Adzes, Whitipirorua site. 94. AU1372/1. 95. AR4731. 96. AR7745. 97. AR7549.

points on the front and on the back near the blade. No polish is present on the sides suggesting the adze was in the process of being reworked and reduced from an originally wider shape. There is no discernable bevel. The adze measures 80 mm long x 26 mm wide. The width in the vicinity of the blade is 28 mm.

AU1372/1 (Fig. 94), made of Tahanga basalt, has a quadrangular cross-section with the back slightly narrower than the front. The cross-section at the butt end is asymmetrical. The adze most closely fits Duff's Type 2A and is flaked, with polish present on the front and within the general bevel area on the back. There is no defined bevel and the cutting edge of the blade is squared off. This possibly indicates the adze is unfinished and the blade not yet sharpened. Cortex is present on the front and on the poll. The blade width is 45 mm.

AR4731 (Fig. 95), is made of argillite. The adze fragment, of which only the blade end is present, is highly polished all over and has hammerdressing scars on one edge on the front. There is no clearly defined bevel. The cross-section is rounded rectangular with the back slightly narrower than the front. This type of adze is found in early sites as well as being the more common form in later sites.

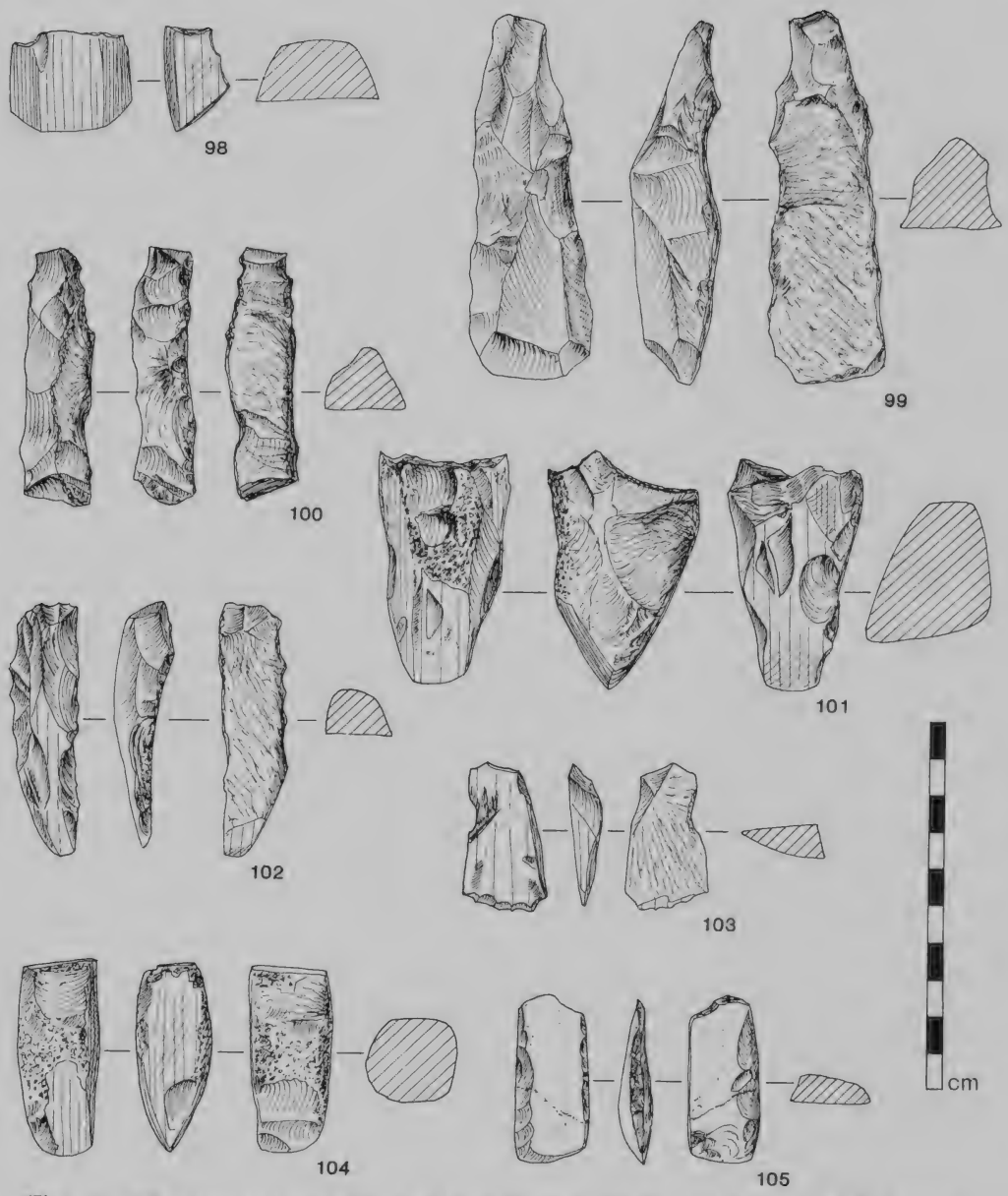
AR7745 (Fig. 96) is a roughly shaped adze made from basalt. Flaked all over, the adze has polish on front and back and a very small amount on one side. The cross-section is quadrangular with the back slightly narrower than the front. The blade is flaked and irregular with hammerdressing scars on one edge, probably as a result of trying to reduce the blade width in this area. The plane of the adze is skewed to one side. Cortex is present on the back although this is very weathered and has considerable use-polish or patina on it. The adze may be the result of an attempt to rework and reshape a damaged artefact. This item was found during the 1986 excavation in an area of fire rakeout and midden, and can be assigned to the third occupation on the site (Furey, in prep.).

AR7549 (Fig. 97), also made from Tahanga basalt, has a quadrangular cross-section with the back narrower than the front. This adze form approximates Duff's Type 2C. The adze has polish all over with flake scars evident on the sides and front near the poll. Hammerdressing occurs on the edges on the front where the adze was lashed to the haft. The blade width is 51.5 mm.

Triangular adzes

AU1593/13 (Fig. 98), of which only a fragment remains, is the blade of what was probably a triangular cross-sectioned hogback adze. The surface is polished all over. The angle of the blade is unusually steep and the blade itself, which is 20 mm long, is slightly curved and very sharp.

AU1372/4 (Fig. 99) is a blank for a triangular cross-sectioned adze made from basalt. The front is relatively unmodified, reflecting its flake origin. Neither blade nor bevel have been formed and the artefact seems to have been a reject, probably because the remnant high point on the back was not able to be removed. There is evidence of bruising in the vicinity of the high point indicating attempts were made at removal.



Figs. 98-105. Adzes and preforms of triangular cross-section, and chisels, Whitipirorua site. 98-100. Triangular cross-sectioned adzes and preforms. 98. AU1593/13. 99. AU1372/4. 100. AR283. 101-105. Chisels. 101. AR7723. 102. AU1281/6. 103. AR7741. 104. AR221. 105. AU1609.

AR283 (Fig. 100) is a triangular cross-sectioned chisel or gouge preform which has been bi-laterally flaked. The stone material is a fine grained black basalt. It is probably part of a larger piece which broke. Some further reduction flaking has occurred at one end.

Chisels

The chisels in the collection are small and functional (Figs. 101-105). Generally not manufactured to any formal type they reflect minimal adaptation of materials available. One exception is AR7723 (Fig. 101), represented by the blade of a basalt hogback Duff Type 4A with a triangular cross-section. The narrow blade, 15 mm wide, is highly polished as is the bevel and existing front portion, although deep flake scars are also present in this area. Hammerdressing is evident on the apex above the bevel area.

AR7741 (Fig. 103) is unique in the collection, being made of metasomatised green argillite. Rounded in cross-section it most closely resembles Duff's Type 6 gouges. Polish occurs on the back near the blade and a small portion remains on the front in the same location. Flake scars and an irregular blade suggest considerable damage, making the chisel unusable in its present form. The blade is ca.13 mm wide. Hammerdressing also occurs on front and back and on one side, the remaining side being highly polished. This chisel or gouge was found in the fill of a pit during the 1986 excavation. Because it may have been fill obtained from elsewhere on the site, it cannot be dated with any confidence (see Furey, in prep.).

AU1281/6 (Fig. 102) is made on a basalt flake which has had secondary flaking to steepen the sides. The cross-section is quadrangular with the front narrower than the back. Polish is present on the front and back and on the sides in the vicinity of the blade which is skewed to one side. The chisel has an overall length of 68 mm while the blade is 6 mm wide.

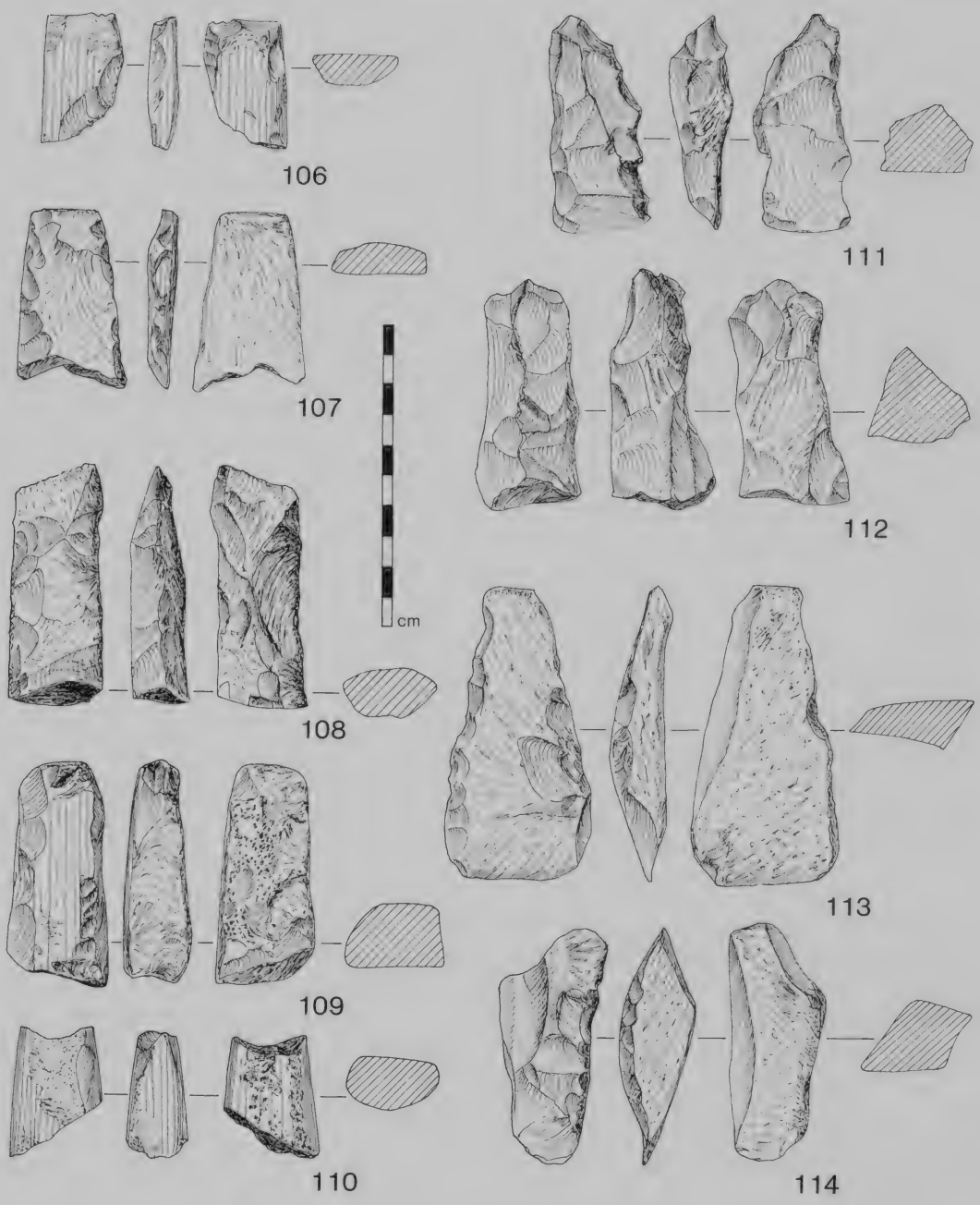
Made on an adze flake, AR221 (Fig. 104) is an example of re-use of stone material. On the front and one side the chisel has polish from the original adze. The flake has been ground on the remaining side and on the back near the lower edge to form the chisel blade. The blade is chipped along its length and is no longer straight. The blade length is now difficult to determine but would not have exceeded 21 mm.

AU1609 (Fig. 105) is made on a small chert flake and is irregular in cross-section. Reduction flaking has occurred on the sides. Flaking is also present on the front at the blade end but this is more likely to have been caused by use rather than shaping. Polish is present near the blade on the back and also on the sides of the chisel, except in the vicinity of the haft lashing. The length is 45 mm while the blade width is 17 mm.

Miscellaneous adzes and preforms

The following adze fragments (Figs. 106-110) have been included to show the variety of cross-sections and shapes found in the adze material from the site.

AR268 (Fig. 108) is a triangular to lenticular cross-sectioned adze or chisel blank made of a fine grained basalt. Quadri-laterally flaked all over, like many other blanks from the site it appears to have broken during manufacture.



Figs. 106-114. Adzes of miscellaneous form and flake adzes, Whitipirorua site. 106-110. Miscellaneous adze forms. 106. AR6336. 107. AR4887. 108. AR268. 109. AR4824. 110. AR4726. Chert preforms. 111. AR204. 112. AR4892. Flake adzes. 113. AU1372/2. 114. AR4653.

AR4887 (Fig. 107), again made of basalt, has a flat cross-section and is made on a flake. One surface displays the unmodified positive bulb of percussion while the other side has small reduction flake scars near the edges. The sides are ground up to the butt.

AR6336 (Fig.106) is part of a small basalt adze or chisel with polish on all surfaces. Like AR4887 it has a flattened cross-section and is represented by the mid-portion of the tool.

AR4824 (Fig. 109), also made of basalt, is an example of a reworked adze. Probably originally of quadrangular cross-section, it is now asymmetrical, having been reworked along one side. Polish occurs on the upper surface and a small amount is on the reverse side near the break. Flake scars on the newly formed side and on the reverse side have been hammerdressed. It probably represents the butt end of an adze.

AR4726 (Fig. 110) is part of an asymmetrically cross-sectioned basalt adze or chisel which reduces in width at one end. It is polished over most of the surface.

Chert adzes

In addition to the chisel illustrated in Fig. 105 five small reject adze blanks made from chert are in the assemblage. Two are illustrated in Figs. 111,112. The remaining three are irregularly shaped in cross-section.

AR204 (Fig. 111) has a sub-triangular cross-section with the back narrower than the front. A protrusion on one side which was not able to be removed has probably led to this piece being rejected.

AR4892 (Fig. 112) is also a sub-triangular section piece which narrows slightly at one end. The blank is incomplete and appears to have broken through end shock during manufacture.

Flake adzes

The flake adzes in the collection show minimal modification and are essentially flakes which have a small amount of polishing, or have use-polish to indicate that they have been used in an adzing or chiselling fashion. A number of the other adzes previously described are also flake adzes in the strict definition, in that they were made on flakes, but they have undergone further shaping and modification.

AU1372/2 and AR4653 (Figs. 113,114) are basalt flake adzes of irregular shape and cross-section. AU1372/2 has bi-lateral reduction flaking on one side and a small amount of polish on high points near the positive bulb of percussion. The reverse side is cortex. The blade, which has use polish, is otherwise unmodified.

AR4653 also has minimal modification. The broad striking platform of the flake forms one side of the adze. A large protruberance juts out the other side. Flakes have been removed from the blade area to steepen the angle on one side and polish occurs on high points on front and back. The curved blade also has a small amount of polish.

The remaining fragments of adze and chisel blanks in the collection are all made from Tahanga basalt.

HAMMERSTONES

Five hammerstones (Figs. 115-119) have been identified from the characteristic bruising apparent on one or more surfaces. Four of these are natural water-rolled cobbles while AR6234 (Fig. 118) was originally the butt end of a basalt adze preform.

AR4421 (Fig. 116) has a bruised and flattened appearance around the entire circumference. The impact points on the remaining hammerstones are indicated on the illustrations.

Figs. 115-119. Hammerstones, Whitipirorua site. 115. AU1385. 116. AR4421. 117. AR6619. 118. AR6234. 119. AU1593/3.

AU1385 (Fig. 115) and AU1593/3 (Fig. 119) are of a coarse silicified sandstone material, while AR4421 (Fig. 116) and AR6619 (Fig. 117) are both ignimbrite. These stone materials are available in places along the eastern coast of the Coromandel Peninsula (Anon. 1968, 1975: Geology maps).

DRILLPOINTS

A large number of drillpoints, approaching several hundred, have been recovered from the site. A selection of these are illustrated in Figs. 120-153.

The majority of the drillpoints are chert, ranging from sinter through to fine grained cherts sometimes called jasper and chalcedony, but argillite (AU1716/10, Fig. 127), obsidian (AR203, AR7866; Figs. 123,126) and basalt (AR4623, AR4933, AR4453, AR4830; Figs. 124,129,139,150) also occur. The range of sizes available is indicated in the illustrations.

Two cross-sectional shapes, triangular and rectangular, are apparent and as Harsant (1985:21) found, the method of manufacture and direction of flaking is different for each shape. Rectangular shapes were formed by uni-facial bi-lateral flaking, while triangular drillpoints have uni-facial or bi-facial tri-lateral flaking.

Examples of double ended points occur (AR346, AR4894; Figs. 135,146) although these are not common.

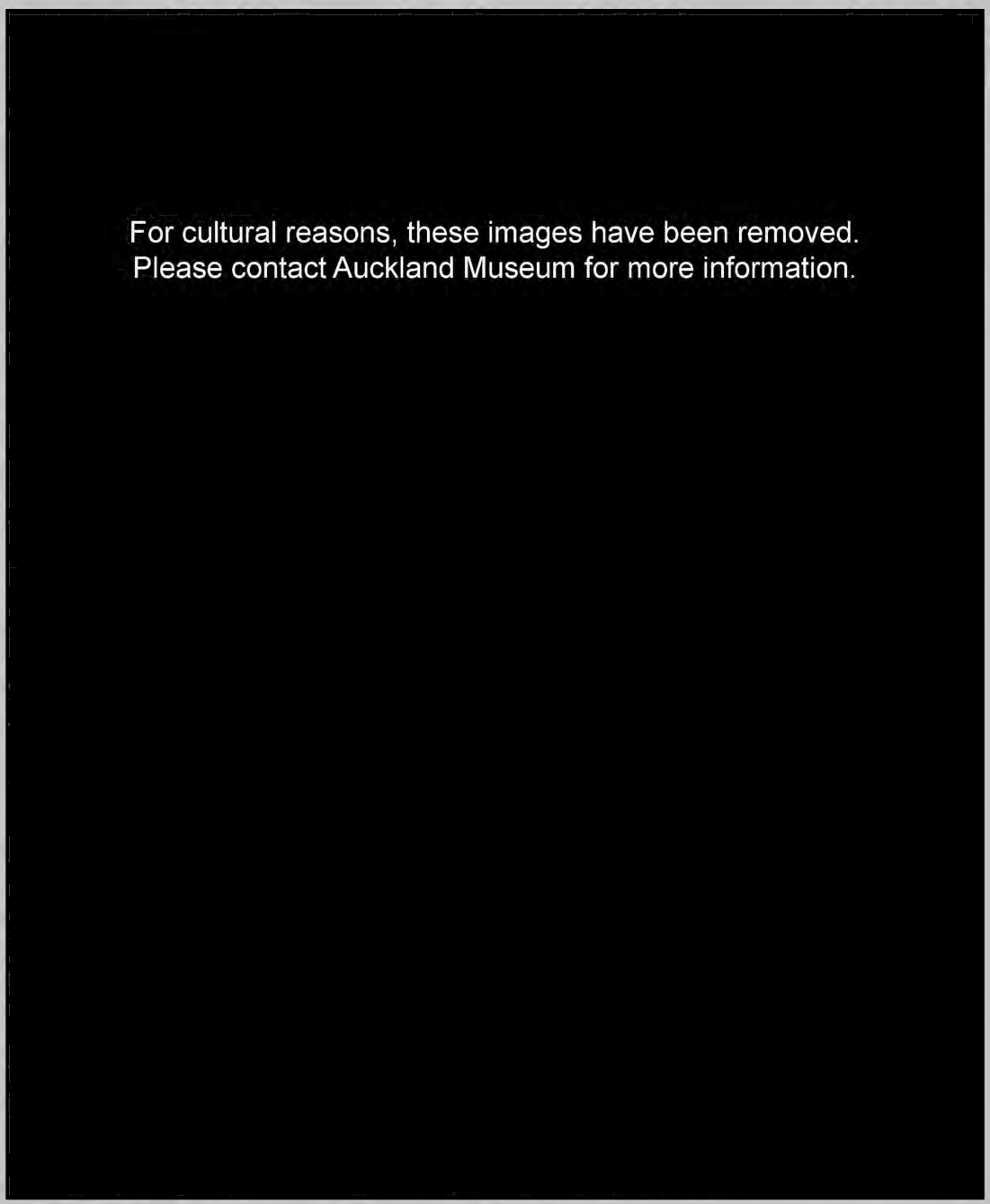
STONE FLAKES AND FLAKE TOOLS

A large amount of stone material is present in the collection. In excess of 60 kg of flakes of chert, basalt and obsidian have been recovered, roughly in proportions of 45%, 35% and 20%. Cortex is present on many of the flakes of all three stone materials. No analysis has been carried out.

The basalt is consistent in texture and a range of flake sizes is apparent. The number of cortex flakes suggest unmodified boulders of Tahanga basalt were being brought to the site for adze manufacture, although importation of some adze blanks, prepared at the Tahanga source, cannot be ruled out.

Both green and grey coloured obsidian were present. A large proportion of the grey coloured flakes had cortex on one or more surfaces, suggesting small cobbles were being used. This is consistent with the form of the obsidian which occurs naturally at Whitipirorua (Onemana) and over the wider Whitipirorua Peninsula area collectively known as the Whangamata source. The green obsidian is most likely from Mayor I, less than 35 km distance. A count of one randomly selected bag of flakes (AU1301) indicated 84 grey coloured flakes and 15 green flakes. These proportions are probably typical of the obsidian assemblage overall.

The chert is most likely from a local source and ranges from sinter, with quartz particles embedded in a rough textured cortex, to a finer grained chert. Water rolled curved surfaces also occur.



Figs. 120-153. Drillpoints, Whitipirorua site. 120. AR4990. 121. AR7493. 122. AR4990. 123. AR203. 124. AR4623. 125. AU1592/7. 126. AR7866. 127. AU1716/10. 128. AU1722/12. 129. AR4933. 130. AR350. 131. AR4990. 132. AR346. 133. AR307. 134. AR267. 135. AR346. 136. AR4693. 137. AR4990. 138. AR267. 139. AR4453. 140. AR4439. 141. AR4616. 142. AR350. 143. AR267. 144. AR4990. 145. AR4629. 146. AR4894. 147. AU1603. 148. AR4629. 149. AR4990. 150. AR4830. 151. AR4629. 152. AR4857. 153. AR267.

Within the large amount of stone material from the site were several flaked pieces which showed evidence of further modification or use wear. A selection of these are shown in Figs. 154-159 and Figs. 160-164.

One type are the stone 'awls' with secondary flaking on two sides to produce a point. AR7729 (Fig. 159), made from a basalt flake, is one such tool. The point has broken off. A similar tool, also in basalt, (AR4803, Fig. 158) has reduction flaking along one edge. These tools may have been hand-held and used for working wood.

AR4577 (Fig. 156) is the butt end of an adze preform and has hammerdressing on the edges. The fracturing of the stone created a point which has been subsequently used as a tool, perhaps for the same purpose as the 'awls' described above. The point of this tool has considerable use polish and wear.

Figs. 154-159. Worked basalt, Whitipirorua site. 154. AU1524/2. 155. AR4922. 156. AR4577. 157. AR4834. 158. AR4803. 159. AR7729.

AU1524/2 (Fig. 154) and AR4922 (Fig. 155) have similar patterns of usewear. AU1524/2 has considerable usewear and polish on the narrow end, with a curved end reminiscent of a blade 6 mm in length. Use polish on the back and sides near this blade suggests the tool was used in a chisel-like fashion. The blade may have been ground. AR4922 is an unmodified cortex flake which also has evidence of usewear and smoothing or polish at the narrow end. Both pieces are Tahanga basalt. A rubbing action on harder materials such as wood or bone is more likely to have produced the distinctive use-polish on the harder basalt than a similar action on skin or fibres. Tools resembling these are described from the Wheritoa site where Crosby (1977:9-10) interpreted them as hand-held grooving tools. A basalt point from Hot Water Beach, described in Leahy (1974:51-52), may be a similar tool but specific references to this type of tool are lacking from reports on other Coromandel Archaic sites.

Figs. 160-164. Obsidian and chert, Whitipirorua site. 160-163. Obsidian. 160. AR4981. 161. AU1385. 162. AR4663. 163. AU1285/4. Chert. 164. AR4800.

Some obsidian flakes and cores also showed evidence of further modification. All were green in colour, suggesting a Mayor I source. The use damage on AU1285/4 (Fig. 163) is consistent with it having been used as a 'spokeshave'. Heavy uni-lateral use wear is present in a concave-shaped bite on the flake. AR4663 (Fig. 162) is a triangular cross-sectioned flake with bruising on the narrow pointed end. The point is curved and blade-like and is not dis-similar to the basalt 'grooving tools' described above. AR4981 (Fig. 160) is a large obsidian core with bruising or blunting of raised flake ridges at the upper end. This would be consistent with modification for hand-holding, perhaps to use as a heavy chopping or butchering tool. The opposite end shows some evidence of use-wear. AU1385 (Fig. 161) has usewear along the curved side.

A chert piece (AR4800, Fig. 164) with cortex on two sides has a rectangular cross-section and has had trimming flakes removed from both sides at the lower end. There is no evidence of usewear on this surface but chert, being relatively hard, may not show evidence of wear unless use was prolonged or the opposing material very hard or abrasive.

STONE FILES AND ABRADERS

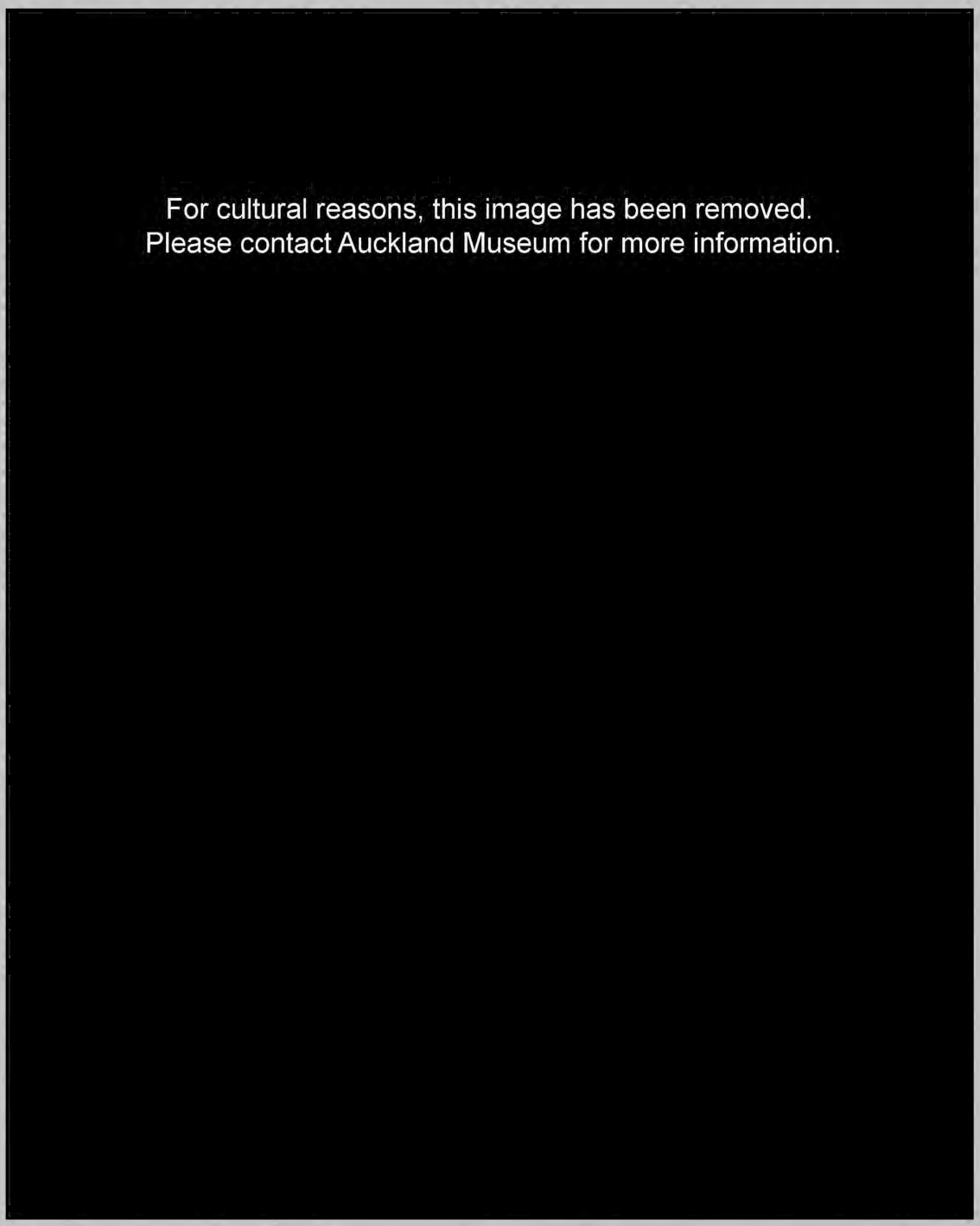
A large number of sandstone files, file fragments and file blanks are included in the collection. A selection are illustrated in Figs. 165-194. The material is a partly silicified sandstone which varies from a fine through to a coarse grained texture. It is likely these derive from sedimentary deposits associated with the Whitianga Group geological formation which occurs within the wider local area (R. Brassey, pers. comm.).

The technique of file manufacture is similar to that described in Law (1970) where blocks of sandstone were sawn or pecked and the resultant groove snapped through, creating two file blanks or roughouts. It is likely the blocks were initially prepared by flaking to a rounded or oval shape before being split, thus accounting for the large amount of small flakes or chips of sandstone present. Fig. 165 (AU1375) shows the method of splitting larger blocks while Fig. 166 (AR4964) illustrates a shaped, but unused, file.

The files can be grouped into several categories. The majority are oval in cross-section with a rounded head.

Several have a shaped head (AR4672, AR4748, AR306, AR4667; Figs. 182,180,183,173) and may have had a particular function, for example, smoothing the inner curve of one-piece fishhooks.

A second group has a flat cross-section (AR4763, AR352 and AR315/AR349 which fit together; Figs. 184,192,194). Two of these (AR4763, AR315/AR349) are of a finer grained sandstone and both are worn on one side suggesting a specific use such as scarfing the notches for the line lashing on fishhooks (D. Bonica pers. comm.). AR352, although ground on all surfaces, has squared edges.



Figs. 165-194. Stone files, Whitipirorua site. 165. AU1375. 166. AR4964. 167. AR326. 168. AR4573. 169. AR4797. 170. AU1722/11. 171. AR316. 172. AU1522/57. 173. AR4667. 174. AR264. 175. AR347. 176. AR7493. 177. AR347. 178. AR4886. 179. AR347. 180. AR4748. 181. AR4886. 182. AR4672. 183. AR306. 184. AR4763. 185. AR4850. 186. AR4636. 187. AR4459. 188. AR4886. 189. AR4762. 190. AU1281/1. 191. AU1591/1. 192. AR352. 193. AR4743. 194. AR315/AR349.

Two files are rounded in cross-section (AU1281/1, AU1591/1; Figs. 190,191) and are of a larger diameter. AU1591/1 has a small rounded tip. One triangular cross-sectioned file (AR4797) is illustrated in Fig. 169, and an unusually shaped piece, AR4743 (Fig. 193) shows heavy use with four curved surfaces.

HOANGA

Five hoanga, or grindstones, of the same material as the majority of the sandstone files, are present. Several have two or more worn surfaces. The largest, AR565, is 215 x 120 mm and is smoothed on only one surface.

PUMICE

A large amount of pumice was present in the samples recovered from the site. The majority was in a natural state, having a smooth, rounded appearance consistent with having been sea-rafted, and showing no evidence of use or alteration.

Nine artefactual pieces were identified, ranging from possible abraders to shaped and drilled objects of unknown function. Seven of these are shown in Figs. 195-201.

Figs. 195-201. Pumice, Whitipirorua site. 195. AR281. 196. AR7722/1. 197. AU1593. 198. AR7722/2. 199. AU1293. 200. AR7721. 201. AR4419.

Three pieces may have been used as abraders. AU1293 (Fig. 199) has several curved surfaces suggesting it has been rubbed back and forth across another object, while AR7721 (Fig. 200) is file shaped. The third piece identified as an abrader is a natural pumice piece with one flattened surface and the dark outer cortex has been removed.

AR7722/1 (Fig. 196) has two small grooves at one end, indicating use for smoothing or polishing a small bone or wood shaft. AU1522 with a groove at one end may have had a similar function.

AU1593 (Fig. 197), although incomplete, has been shaped on the outer edge and the centre is in the process of being drilled or gouged out from both sides. Similarly, AR4419 (Fig. 201), also incomplete, may have been shaped on the outer curve and has scars from two drill holes. The function of both of these is unknown but shaped pumice is present in other sites.

AR7722/2 (Fig. 198) shows a piece that has two opposing depressions, one on either side, connected by a shallow straight-sided groove over the curved surface of the object.

A piece with a depression in one surface, AR281 (Fig. 195) completes the collection of pumice artefacts.

FISHING SINKER

A water-rolled ignimbrite pebble (AR6213, Fig. 202) with a pecked groove around its circumference is most likely a fishing sinker. It measures 60 x 46 mm and weighs 172 g.

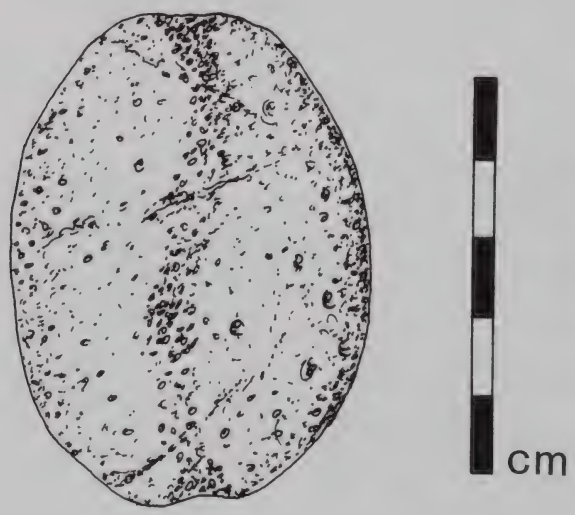


Fig. 202. Fishing sinker, Whitipirorua site. AR6213.

BONE MATERIAL

Sea mammal, whale, moa, dog, bird and fish bone, present in the collection, have yet to be identified and speciated.

It is apparent that moa were hunted for food during at least one occupation of the site. The amount of moa bone and the presence of moa eggshell from several separate locations within the site indicates contemporaneity of moa and the site's occupation. This is in contrast to several other sites (for example Wheritoa) where it was suggested that the small amount of moa bone may have been imported or have been sub-fossil.

THE SITE

The site takes its name from the traditional name for the area, identified on a Land Court map (ML2569) dated 1872. Onemana, the present name for the beach, was adopted in the 1970's as the name of the beach subdivision but has no traditional relationship to the area.

Onemana Beach has one main stream which flows out near the centre of the beach. The Whitipirorua site extending over a distance of about 200 m was situated between this stream and the intermittent watercourse near the southern end of the beach (Fig. 2).

Before the residential subdivision in 1974, the beach dunes backed up to steep-sided spurs. The dunes themselves were of a higher level than the adjacent beach. Bare patches in the dune vegetation, evident in aerial photographs of 1966 (Run 1894, Photos H/16 and 17) indicate surface erosion was occurring.

Recontouring of the spur ends and the dune area took place in conjunction with the residential development. Spoil from the spurs was pushed forward over part of the dune area, probably preserving part of the site under several metres of clay and a tennis court. A toilet block was built on the site itself and now marks the northern boundary of the remaining intact cultural material.

The site continues to erode on the seaward margin, with at least 25 m having been destroyed in one particular place over the last 15 years.

The Onemana area is well-endowed with the obsidian and chert stone materials utilised in the site. Chert outcrops occur on the ridges behind the beach although there is no evidence that these particular outcrops were used (J. Coster, pers. comm.). The chert utilised in the site is more likely to have come from a stream or beach as many flakes have a water-rolled cortex.

Obsidian, in the form of small cobbles and boulders about 20 cm in diameter, is found in the clay of the spurs backing the beach. It also occurs in the stream beds and beaches on the Whangamata Harbour side of the Whitipirorua Peninsula (J. Coster and P. Moore pers. comm.).

In 1986, the author carried out a small investigation of an eroding part of the site to document the stratigraphy and obtain suitable samples for radiocarbon dating. The results of these investigations will be presented in due course (Furey, in prep.). Briefly, the stratigraphy from the excavation can be summarised as representing three occupation layers separated by sterile sand. These occupation surfaces occurred over most of the excavated area. In one area there is the potential for one or two additional earlier occupations (the lowest layers were not fully excavated in this square).

Radiocarbon age estimates for the earliest investigated occupation level, based on pipi shell, had a conventional age of 990 ± 50 years BP (WK1515). Using the carbon cycle model calibration curve of Stuiver, Pearson and Braziunas (1986), there is statistically a 85% confidence level that the occupation fell within the period 1285AD-1437AD with a median age distribution of 1359AD. The most recent occupation, with an age estimate obtained on cockle shell had a conventional age of 870 ± 45 years BP (WK1169). There is a 95% confidence level the occupation falls within the period 1352-1521AD with a median age distribution of 1444AD.

Several Archaic sites occur within a small area on this part of the Coromandel east coast. In addition to Whitipirorua, Archaic-type artefacts have been recovered from N49/33 (T12/26), also known as Whitipirorua Site 3 (Jolly 1978a), and from Whangamata where two closely located sites, Whangamata Wharf site (Allo 1972) and Cabana Lodge (Jolly 1978b) occur at the mouth of the Whangamata Harbour (Fig. 1). There are also unsubstantiated reports of Archaic material being found near the mouth of the Otahu River at the south end of Whangamata. With the exception of Whitipirorua, none of these sites have been dated.

DISCUSSION

The artefacts from Whitipirorua bear a strong resemblance to artefact assemblages from other earlier sites on the Coromandel east coast. Davidson (1979) provided a summary of major artefactual material recovered from some of these sites, and further excavations and reports have subsequently added to this.

It is apparent that the Whitipirorua site has the most extensive range of Archaic material of any of the reported Coromandel sites. This is possibly due to the methods of collection which covered a long period of time ranging over the entire site. Other sites such as Hot Water Beach, Hahei and Opito Beach Midden (N40/3) produced a number of artefacts within a more restricted range and confined to small archaeologically excavated areas. A wide variety of artefact types is also known from the Wheritoa site where, like Whitipirorua, a considerable amount of unrestricted and uncontrolled collecting activity took place.

The Archaic assemblage, excluding adzes, as defined by Golson (1959) is well represented, reinforcing the theory of homogeneity of artefact types in the early period of settlement from sites that are geographically distanced. In addition to the early 'marker' artefacts such as bone reels, other artefact types, for example perforated shark's teeth, bird spears and *Dentalium nanum* shell segments, which occur throughout the prehistoric period are also demonstrably early and are likely therefore to be based on styles with origins in Eastern Polynesia. Some of the artefact types in

the Whitipirorua site have direct parallels in East Polynesian culture. Several of the trolling lure shanks, and ornaments such as perforated teeth, imitation whale tooth units and reels, stand out as being very similar to artefacts from sites in the Marquesas and Society Islands which have been dated to around the accepted settlement period of New Zealand.

While the large marjority of the artefacts from the Whitipirorua site cannot be dated, the radiocarbon dates from recent excavations on the site, and the absence of any occupation layers post-dating the 15th century, enable the artefacts to be securely assigned to the Archaic period and thus can be attributed to within the first few hundred years of this settlement period.

Several observations, relating to both the artefacts and a wider cultural significance, can be made from the study of the Whitipirorua collection.

There is a lack of finished and complete adzes from the site compared with other collections from early sites elsewhere, for example the Brambley Collection from Manukau South Head (Prickett 1987). Like other Coromandel sites there is a high proportion of roughouts to finished adzes, indicating adze manufacture was an important activity which Harsant (1985:35) suggested may have been directed towards trading of surplus tools. In addition, with a few exceptions, the adzes and preforms present do not fit into the formal typology developed by Duff (1977). Made from Tahanga basalt, the adzes and roughouts follow the trend observed on other Coromandel sites where more irregularly shaped adzes predominate (Boileau 1980:75, Crosby 1977:8 and Harsant 1985). This may be specifically related to the use of Tahanga basalt (Davidson 1979:199). The adzes from this site, like assemblages from other excavated sites, tend to have minimal finishing polish — the tools are flaked and flake scars hammerdressed to remove high points.

It is also apparent that there was a heavy reliance on local Coromandel stone materials for tool manufacture. Tahanga basalt from Opito was obviously a very important source of stone for adzes. With the exception of three items, the remainder of the finished adze fragments and roughouts were made of Tahanga basalt. The number of waste flakes, many of which had a curved cortex surface, suggests that weathered boulders or partially prepared blocks of basalt were transported to the site and further reduced into adzes. The on-site manufacture of adzes is also demonstrated from Hahei, Wheritoa and several of the Opito sites (Harsant 1985; Moore 1976:88). It is also apparent from several of the roughouts that re-working and re-shaping of adzes was carried out.

There was also a heavy reliance on the local obsidian and chert which can be found near the site. Obsidian presumed to be from Mayor I (P. Moore, pers. comm.) was also present but in small quantities. This is in contrast to all other Coromandel Archiac sites where Mayor I obsidian predominates, even when local sources occur nearby (for example, Hahei). Interestingly, the Whangamata Wharf site, situated immediately across the narrow harbour from an obsidian source, contained a high proportion of obsidian presumed to be from Mayor I (Allo 1972:66).

The presence of stone, namely schist and metasomatised argillite, from South I sources indicates trade of finished artefacts or raw materials. It is more likely that finished tools were transported to the site as there is an absence of the waste material of manufacture.

The most predominant artefact type at Whitipirorua was the fishing gear. Both trolling and line fishing was important and several of the trolling lure shanks are of a type not commonly found on the Coromandel Peninsula.

The heavy reliance on fishing, adze manufacturing using local Tahanga basalt, and the similarity in appearance to other Coromandel sites suggests a cultural homogeneity spanning several hundred years. Several authors (for example Law 1982:60) have raised the question of why cultural changes occurring immediately outside the Coromandel Peninsula were not adopted by people occupying these sites. One explanation lies in the apparent similarity in content of sites over a considerable time period, and possibly indicates a tradition of conservatism displayed through artefact styles and the subsistence economy based on fishing and birding.

Further archaeological research needs to be carried out on the Coromandel Archaic sites, concentrating not on the artefact and faunal rich beach middens, but on the associated settlements. To date only one Archaic site, Sarah's Gully, which included all components of the settlement has been investigated and has not yet been fully reported on.

Achnowledgements. This paper could not have been written without the assistance of a number of people.

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Joan Lawrence illustrated the artefacts and helped to clarify some problems with descriptions of adzes.

Kath Prickett and Robert Brassey helped identify stone materials in trolling lures, adzes, stone files, hammerstones and drillpoints. Dante Bonica provided information on the uses of stone files and shark tooth drillpoints. Phil Moore confirmed the use of Whangamata and Mayor I obsidian sources after comparing a selection of flakes from the site to known source samples.

Bruce McFadgen recalibrated the radiocarbon dates from the site using the Stuiver, Pearson and Braziunas carbon cycle model calibration curve.

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